



TRANSIT DEVELOPMENT PROGRAM

METROPOLITAN TRANSPORTATION COMMISSION

MAY 8, 1974

BERKELEY, CALIFORNIA

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TRANSIT DEVELOPMENT PROGRAM

FOR THE
SAN FRANCISCO BAY AREA

1975 - 1984

*Transportation San Francisco bay area
Metropolitan " " " " "*

PREPARED BY

METROPOLITAN TRANSPORTATION COMMISSION

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California Department of Transportation

(vacant)

U.S. Department of Housing and Urban
Development

Re: Authorizing Submission of the Transit Development Program to the Urban Mass Transportation Administration.

METROPOLITAN TRANSPORTATION COMMISSION

RESOLUTION NO. 153

WHEREAS, the Urban Mass Transportation Administration (UMTA) of the U.S. Department of Transportation requires that each designated Region adopt and submit annually to UMTA a Transit Development Program in partial fulfillment of Federal requirements to maintain regional eligibility for Federal transportation grants; and

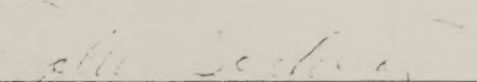
WHEREAS, MTC has been designated as the regionwide transportation planning agency for the nine-county Bay Area Region; and

WHEREAS, MTC has prepared the Region's annual Transit Development Program for the 10-year period beginning with fiscal year 1975; now, therefore, be it

Resolved, that the Metropolitan Transportation Commission hereby adopts said Transit Development Program as its guide to the Region's transit improvement subject to the modification and refinements that may arise as part of MTC's Regional Transportation Plan's annual revisions which are scheduled to be adopted by June 30, 1974; and be it further

Resolved, that the Commission hereby authorize submission of the Transit Development Program to the Urban Mass Transportation Administration.

METROPOLITAN TRANSPORTATION COMMISSION



John C. Beckett, Chairman

The above resolution was entered into by the Metropolitan Transportation Commission at a regular meeting of the Commission held in Oakland, California, May 8, 1974.



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Chapter I

INTRODUCTION

WHY A TRANSIT DEVELOPMENT PROGRAM?

The Urban Mass Transportation Administration (UMTA) of the U.S. Department of Transportation is the major source of funding for new transit capital investments. In addition, UMTA provides funding assistance for transit planning projects which establish the need and specifications for these capital investments. As yet, the Federal government has not chosen to financially support transit operating costs, but may reverse this position before long.

UMTA requires that the numerous regions of the U.S. maintain a comprehensive area-wide transit planning process in addition to planning transit improvements on a project-by-project basis.* The Metropolitan Transportation Commission has been designated by UMTA as the agency responsible for carrying out this overall planning in the Bay Area. This regional planning is mandatory in order to avoid duplication of effort and assist UMTA in making funding decisions among competing projects within metropolitan areas.

*This document is prepared in part to fulfill the UMTA planning requirements and maintain the region's eligibility for transit capital grants.

This Transit Development Program goes beyond the purpose of meeting Federal grant eligibility requirements. It also represents a considerable refinement of MTC's planning and decision-making process based on California legislation creating the Commission in 1970. Specifically, this document represents a partial basis for refinement of Chapter IV of the Regional Transportation Plan, the guide to Bay Area transport development adopted by MTC in June of 1973.

WHY TRANSIT DEVELOPMENT?

Renewed interest has been generated in public transportation during the past several years. The conditions which influence travel behavior are becoming ever more unstable, as witness the recent gasoline supply situation; but for the most part the trend to public transportation can be expected to continue, as it is the basic alternative to the auto for accommodating large volumes of travel in metropolitan areas. The evidence supporting the urgent need for such an alternative is undeniable and visible every day in the form of fouled air, traffic accident statistics, deteriorating inner-city neighborhoods, open space lost to uncontrolled suburban sprawl, and hardship imposed on those who do not drive. All of these symptoms of metropolitan environmental decay can be partially attributed to a culture overdependent on the private automobile for travel. The superior convenience of the auto is clear, but this convenience is becoming

insufficient compensation for the aforementioned side effects.

ABOUT THIS DOCUMENT

We have organized this document into ten chapters, of which this introduction is the first. The second chapter describes in detail the organization of transportation planning in the Bay Area. The third chapter explores the current status of public transit systems in the region, including their service characteristics and financing. Chapter four sets forth various low-cost projects which could be implemented in the immediate future to improve transit service. Chapter five describes longer-term, more expensive transit proposals recently planned or in the process of being developed. The sixth chapter is the heart of this document. It contains an evaluation of the various transit improvement proposals and combines them into three alternatives - the Basic, Moderate and Recommended Plans - which represent different levels of expenditure. Chapter seven describes the program of transit service coordination being sponsored by MTC and Chapter Eight includes an analysis of legislative changes necessary to pay for future transit investments. The final two chapters deal with the application of new technology to the region's transit problems and with the periodic updating of this document.

RELATED WORK

This document represents a major input to the revision of Chapter IV of MTC's Regional Transportation Plan, which includes the 10-Year capital improvement plan and priorities for the regional transportation system. Simultaneously, revisions are being made to better define future investment in other modes of transport, especially in highway facilities. Also, Chapter IV of the Regional Transportation Plan will be updated to contain much more precise proposals on the source of revenue to support transportation improvements in all modes.

Chapter II

ORGANIZATION OF TRANSPORTATION PLANNING

A. THE METROPOLITAN TRANSPORTATION COMMISSION

Comprehensive regional transportation planning has been performed in the Bay Area since 1965 when the Bay Area Transportation Study Commission (BATSC) was formed in response to the Federal Highway Act of 1964. This Act required metropolitan areas to conduct regional transportation planning in order to qualify for federal grants for highway construction and other purposes. Prior to the creation of BATSC regional-scale transportation planning had been performed by the California Division of Highways for the state freeway and highway system and by the Bay Area Rapid Transit Study Commission for rail rapid transit. Transportation planning was also accomplished on a smaller geographic scale by the several transit operators and by cities and counties.

BATSC published its regional transportation plan in 1969 and was dissolved in accordance with its enabling legislation. Continuation of the regional transportation planning function was accomplished by the interim Regional Transportation Planning Committee (RTPC) which operated until 1971.

In that year the California Legislature created the Metropolitan Transportation Commission (MTC) to assume the responsibility for regional transportation planning.

The MTC consists of 19 members. The Counties of San Mateo, Alameda, Contra Costa, Santa Clara, and San Francisco have two representatives each, one selected by the County's Board of Supervisors and one selected by the County's Mayors' Selection Committee. The Counties of Marin, Sonoma, Napa, and Solano each have one representative, selected by the County's Board of Supervisors from among three nominees of the Mayors' Selection Committee. The Association of Bay Area Governments (ABAG) and the Bay Conservation and Development Commission each have one voting representative on MTC. Finally, provision is made for non-voting membership from the California Business and Transportation Agency, the U.S. Department of Transportation and the U.S. Department of Housing and Urban Development.

The legislatively outlined function of the MTC is to provide the Bay Area with comprehensive regional transportation planning, including the preparation and periodic updating of a Regional Transportation Plan. With the publication and adoption on June 27, 1973 of this document by MTC, the Commission acquired review powers over a wide range of transportation improvement projects including trans-bay

bridges, state highways and freeways, and mass transit systems. Any such project must be approved prior to construction as consistent with the Regional Transportation Plan and its ten-year capital improvement program. Otherwise, no federal or state funding will be granted to the project.

In 1972 the MTC acquired a further control over regional transportation decisions with the passage of S.B. 325, the Mills-Alquist-Deddeh Act (the Transit Development Act). This Act, which provided new funds for transit capital and operating expenses from the extension of sales tax to include gasoline, designated MTC as the agency to allocate funds within the nine counties. Eligible applicants from each county annually apply to MTC for allocation of these funds. A final aspect of MTC's influence over transportation decisions in the region is the cooperative exercise with the Association of Bay Area Governments of the "A-95" review power. This is the mandatory review for consistency with regional planning objectives necessary for approval of many federal grants.

At the present time the MTC has an adopted Regional Transportation Plan and is preparing for the first annual update of the document. This Transit Development Program will form part of the basis for amending the Plan.

B. OTHER TRANSPORTATION PLANNING AGENCIES

1. The Urban Mass Transportation Administration (UMTA) maintains a regional office in San Francisco which administers the UMTA capital grant and technical studies programs in California and several other western states. This office provides technical assistance in the preparation and monitoring of transit planning projects and capital grant programs.
2. The California Department of Transportation (CALTRANS) maintains a large staff of transportation planners in San Francisco to deal with highway and transit planning in the District 04 region (synonymous with the Bay Area counties except including Santa Cruz and excluding Solano which is in District 10). Previously organized as the Division of Highways with responsibility in the surface auto transport system, CALTRANS is now becoming involved in broader areas of transport planning.
3. The Association of Bay Area Governments (ABAG) is the comprehensive regional land-use planning agency for the Bay Area and is constituted as a council of governments. ABAG possesses the A-95 review power over a large number of capital grant projects including transportation and provides MTC with critical technical data regarding future development, population, and land use trends and objectives.

4. The Bay Conservation and Development Commission (BCDC) is involved in transportation planning and regulation whenever highway or transit proposals have any substantial impact on San Francisco Bay. In preparing plans for the Bay and its land margin, BCDC took transportation needs into consideration, much as MTC considered environmental factors in the preparation of its transportation plan.
5. The Bay Area Air Pollution Control District (BAAPCD) is a regional agency primarily concerned with stationary sources of air pollutants. Recently being considered is extension of the District's regulatory power to include the indirect air pollution effects of private development, e.g. the added auto traffic a shopping center may generate.
6. The U.S. Environmental Protection Agency (EPA) has a western U.S. office located in San Francisco. One of EPA's primary concerns is the improvement of air quality in urban areas, especially as this can be achieved through limitations in auto usage. EPA has, as a result, been very supportive of all programs which cause a reduction in vehicle miles of travel by private autos.
7. The various transit operating agencies generally have small planning staffs, often concentrating on short-term capital and operating projects but sometimes also undertaking long-term planning programs.

8. Numerous Counties and Cities employ transportation planning personnel especially for surface road transport which is more localized than transit service.

C. INTERAGENCY COORDINATION

1. Overlapping Membership. Because of the way in which various regional agencies are constituted there are frequent overlaps in membership. In some cases enabling legislation specifies ex-officio representation, such as ABAG and BCDC on the MTC. Other cases are less formal, such as where a county may appoint the same individual to several agencies.
2. Joint Exercise of Powers Agreements are a device allowed by California statute to create a temporary interagency governing entity capable of policy-making on special projects. Joint Exercise of Powers Agreements have been extensively utilized by MTC to establish Policy Boards of Control for transit planning projects where several existing permanent agencies have strong and sometimes conflicting interests. Typically several representatives from each agency constitute the policy-making Board of Control but in some instances technical staff members have also served as members.
3. Joint Work Program ABAG and MTC maintain a joint planning program to produce technical information regarding trends and predictions of urban development characteristics.

The program is funded jointly by the two agencies and the two staffs work together to accomplish the work program. Similar study efforts are underway or are being developed between MTC and other agencies.

4. MTC Sponsored Committees. The MTC sponsors a number of committees which deal with some problem of transportation which is difficult to resolve without intergovernmental guidance. The MTC's Transit Federation is being established to better coordinate the services provided by the region's various transit operators. It is hoped that the results of this committee's work will mean improved transit usage and a better service provided. Another Committee of this type is the Traffic Coordinating Council. In addition, MTC has a Technical Advisory Committee consisting of various agencies, thus allowing an input of local considerations into the regional planning process.

Chapter III

DESCRIPTION AND EVALUATION OF TRANSIT SYSTEMS

A. TRANSIT SYSTEM CHARACTERISTICS

1. Historical Background of Transit Operations

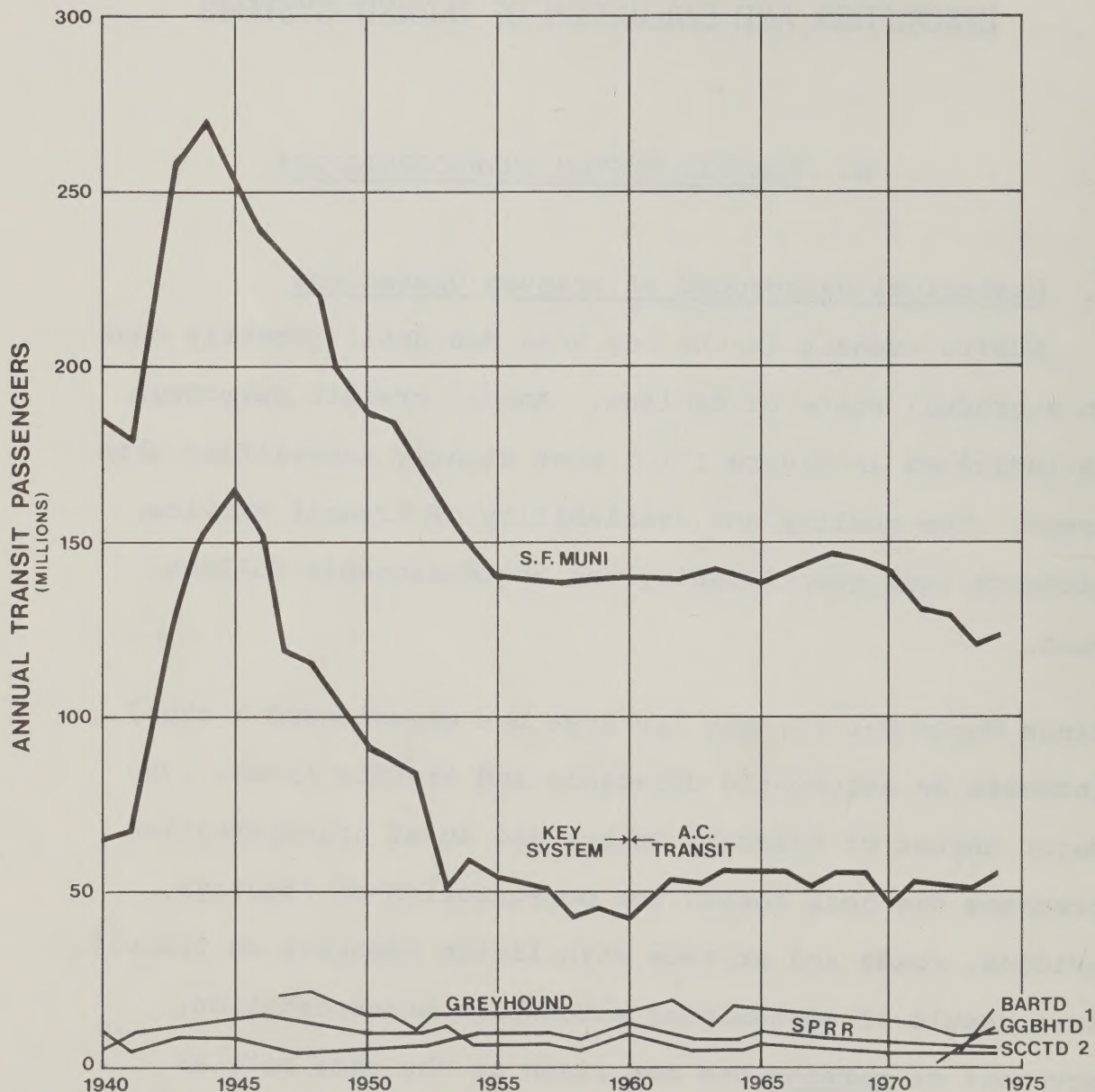
Public transit in the Bay Area has until recently been in a gradual state of decline. Annual transit patronage as indicated in Figure III-1 most clearly exemplifies this trend. The quality and availability of transit service, although less quantifiable, has unquestionably followed suit.

Since World War II, the Bay Area has experienced a rapid increase in automobile ownership and traffic flows. The major thrust of Federal, State, and local transportation programs has been toward the construction of freeways, bridges, roads and streets with little emphasis on transit. As a result of emphasizing automobile transportation, movement of persons has not risen at the same rate as movement of vehicles.*

*BATSC - Bay Area Transportation Report, May 1969.

Figure III-1

ANNUAL TRANSIT PATRONAGE MAJOR OPERATORS



LEGEND

1. Before 1971 service operated by Greyhound
2. Before 1972 service operated by various private companies

On the basis of this information, it would seem that Bay Area residents have accepted continually higher costs** associated with their travel needs in return for the convenience and personal mobility which the automobile unquestionably offers.

In recent years, rebuilding programs for transit have begun in parts of the region where it is felt that transit can offer substantial cost-savings together with a level of service*** approaching or exceeding that of the private car. The approval by voters of the Bay Area Rapid Transit District's (BARTD) three-county plan in 1962 marked the beginning of this activity in public transit on a large scale.

The BARTD vote did more than initiate construction of a 75-mile rapid transit system costing \$1.6 billion. It influenced complementary decisions regarding transit development activities throughout the region which currently total over \$300 million in proposed capital improvements. Together with the creation and enlargement of local and trunkline public transit services now under study, the commitment of the region's resources to public transit is likely to become very much larger in the future.

**Costs in this case are intended to include the use of all resources associated with mobility: materials required to build, fuel required to operate, space required to move and store, pollution (air, noise, congestion) associated with private automobiles vs. transit vehicles.

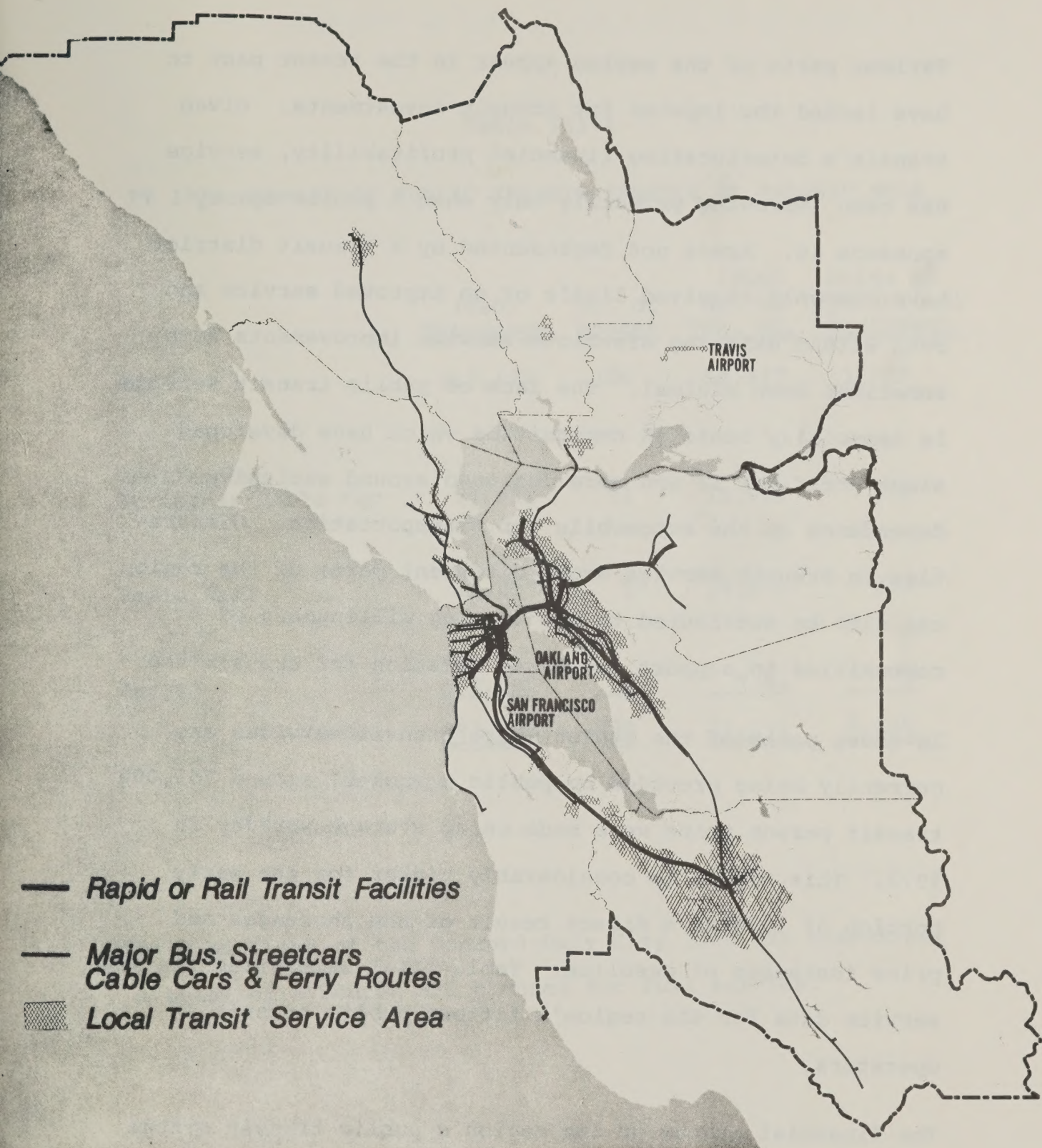
***Level of service is a term used to describe the adequacy of transit services in meeting the mobility needs of a particular population segment, i.e. aspects of convenience, time, cost, comfort, safety.

2. Summary of Existing Public Transit Service in the Bay Area

With several significant exceptions, notably BART, the existing transit system in the Bay Area is concentrated in the older urban areas. Figure III-2 indicates the extent of the current public transit system here. Although many recent investments have been made by transit operators to upgrade service, the bulk of transit improvement proposals are still in various stages of planning or implementation.

An inventory of public transit services offered in the region has been compiled based on information submitted to MTC by the transit operators in conjunction with FY 1974 Claims for funds under the Transit Development Act and on information developed by MTC staff. This information not only describes the status of the region's public transit system in FY 1974, but also provides a planning base upon which any alternative development program must be built.

In total there are fifteen public transit operators offering or in the process of initiating scheduled service in the nine-county Bay Area as of the Spring of 1974. Of these fifteen operators, five are considered "major", carrying 99% of all transit riders, with the remaining services composed of individual municipal operators. The transit operators provide service over 230 routes and operate 2330 transit vehicles of all types for a yearly total of 76,540,000 vehicle miles.



EXISTING TRANSIT FACILITIES

In The San Francisco Bay Region

Various parts of the region appear in the recent past to have lacked the impetus for transit investments. Given transit's deteriorating financial profitability, service has been improving primarily only when a public agency sponsors it. Areas not represented by a transit district have commonly received little or no improved service and even within existing districts service improvements have sometimes been minimal. The lack of public transit service is especially acute in communities which have developed since World War II and were designed around exclusive dependence on the automobile for transportation. Disparities in transit service among different parts of the region can also be attributed to the varying willingness of communities to support increased taxation for transit use.

In those parts of the region where transit services are currently being provided by public agencies, around 755,000 transit person trips were made on an average workday in 1973. This figure is considerably higher for the early portion of 1974 as a direct result of the shortages and price increases of gasoline. Table III-1 summarizes the key service data for the region's fifteen public transit operators.

The financial status of the region's public transit system as of the beginning of FY 1974 is broken down by fund source and expenditure category in Table III-2 and Fig III-3.

Table III-1

FY 1974 SUMMARY OF PUBLIC TRANSIT SERVICE BY TRANSIT MODE

	(000) <u>Patronage</u>	No. of <u>Routes</u>	(000) No. of <u>Veh. Mi.</u>	Units of Operational <u>Equipment</u>
Bus	112,627	206	54,943	1,589
Trolley Bus Streetcar/Cable Car	74,921	21	11,325	490
Rapid Rail	14,827	2*	10,272	250
Ferry	<u>1,000</u>	<u>1</u>	<u>N.A.</u>	<u>1</u>
TOTAL:	<u>203,375</u>	<u>230</u>	<u>76,540</u>	<u>2,330</u>

*Only portions of the Concord-Daly City line are operating.

A total of 4 routes are planned for full service.

Table III-2

FY 1974 SUMMARY OF TRANSIT FUND SOURCES AND EXPENDITURES

(Millions of Dollars)

FUND SOURCES

Operating Revenues	\$ 73.58
Property Tax/General Funds	94.66
Sales Tax	33.91
Bond Proceeds	78.27
Transportation Development Act Funds	22.95
Bridge Tolls	19.98
Reserves	10.90
Other Local	8.03
Federal	<u>113.01</u>

TOTAL REVENUE: \$455.29

EXPENDITURES

Operations Cost	\$143.22
Capital Improvements	218.95
Debt Service	<u>93.12</u>

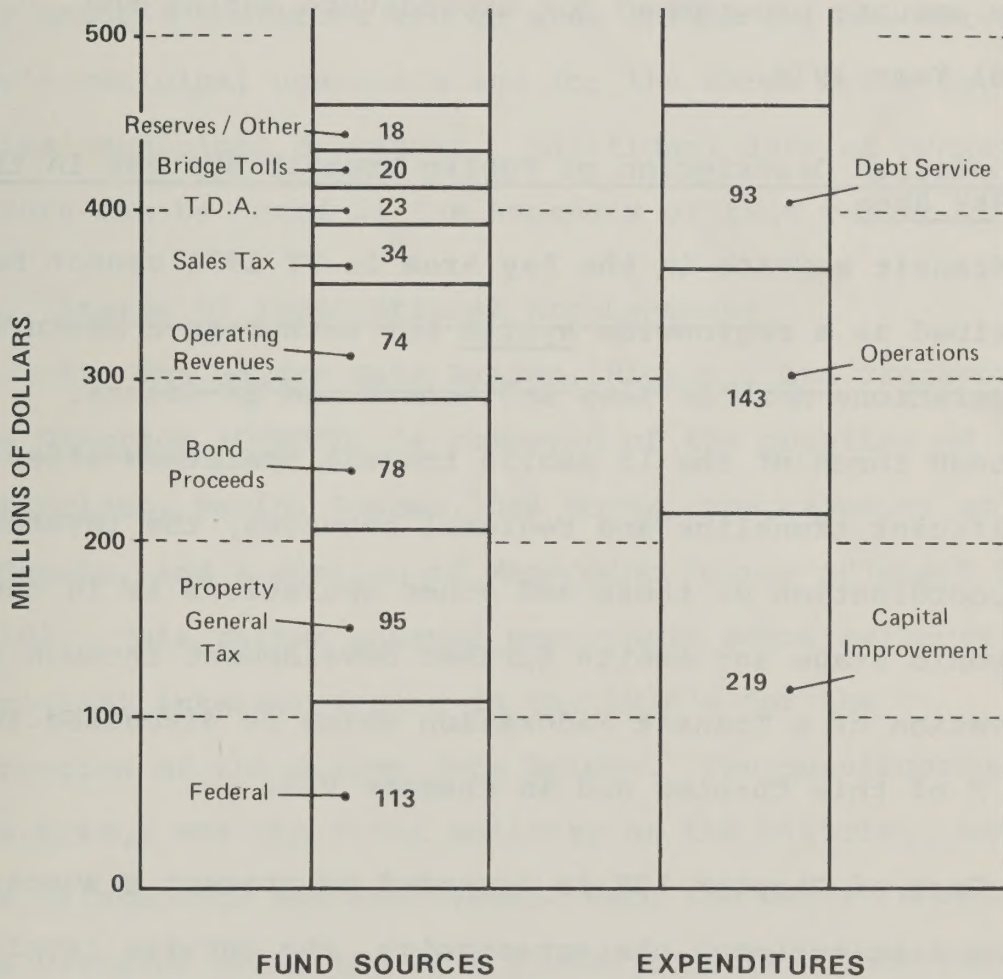
TOTAL OUTLAY: \$455.29

Source: FY 1974 TDA Claims

Figure III-3

SUMMARY OF FUND SOURCES AND EXPENDITURES

F.Y. 1974



Operations deficits reflect a continuation of transit financing difficulties with a rapidly escalating cost of labor and materials. Deficits should not be considered indicative of inefficiency but rather the result of a conscious low-fare policy which guards against patronage losses. Capital improvements and debt support indicate those amounts programmed for expenditure during the Fiscal Year 1974.

3. Detailed Description of Public Transit Systems in the Bay Area

Transit service in the Bay Area in FY 1974 cannot be described as a regionwide system but rather as a mixture of operations more or less self-contained in nature. Although three of the 15 public transit operators offer significant trunkline and regional services, the interaction and coordination of these and other operations is in the embryonic stage and awaits further development through the activation of a Transit Federation which is discussed in Part F of this Chapter and in Chapter VII.

This Part of Chapter III is intended to present a summary of the institutional characteristics, the service levels, and the financial status of each of the region's public transit operators. Included are:

- a description of the powers and geographic jurisdiction afforded to the various operators by statute;

- a description of the transit services provided by each operator during FY 1974; and
- a discussion of anticipated funding sources and needs for each operator in ensuing years derived from applications for Transit Development Act funds submitted to MTC in the spring of 1973.

This material is presented individually for the five major public transit operators and in area totals for San Mateo County's municipal operators and for the three North Bay Counties' municipal operators. Additional data on transit operators can be found in the Appendix of this report.

a. Status of Institutional Arrangements

1. The Golden Gate Bridge, Highway, and Transportation District (GGBHTD) is composed of the counties of San Francisco, Marin, Sonoma, Del Norte, the majority of Napa County, and a portion of Mendocino County adjacent to U.S. 101. This rather unusual geographic scope reflects the original interest evoked in the 1920's for the construction of the Golden Gate Bridge. The construction of the bridge was the first activity of the District, and bridge maintenance and improvement were the major functions of the District until the 1970's when expansion into the area of public transportation was undertaken. The District has assumed the responsibility for inter-county transit service between Sonoma, Marin, and San Francisco formerly provided by the private operator, Greyhound. In addition

to improving this trans-bay service, the District also operates intra-county transit service in Marin through a contractual agreement with the Marin County Transit District. Intra-County service is not offered in San Francisco in order to avoid competing with MUNI, and no local funding has been made available in Sonoma County as the prerequisite for local service to be provided there by the District. The District is in the process of implementing a ferryboat improvement program, the most expensive component of which is new service between central Marin County (Larkspur) and downtown San Francisco.

At present the District views its role in terms of providing inter-county transit services as well as continuing maintenance, operation, and improvement of the Golden Gate Bridge and its approach highway facilities. Transit services are provided in San Francisco, Marin, and Sonoma Counties but could also be extended to the other counties of the District. The District has the statutory authority to issue bonds or levy taxes based on the assessed ad valorem property of the District, subject to the usual electoral stipulations. The District also has the authority to collect toll revenue for the use of its facilities. In fact, the revenues from motorist use of the Bridge have been the mainstay of the District transit financing.* All revenue bonds related to the bridge

*The round trip bridge toll, set at 50¢ since September of 1955, was raised to 75¢ in March 1974.

itself have been retired, thus allowing additional flexibility in financing from this source. The District is governed by a Board of Directors consisting of 18 members, 9 appointed from San Francisco, 3 each from Marin and Sonoma, and one each from Del Norte, Napa, and Mendocino. The appointing authorities are the legislative and executive branches of the various county governments.

2. The Marin County Transit District (MCTD)

consists of the five Marin County Supervisors plus two city mayors (or councilmen) selected by the City Selection Committee, and extends over the whole of Marin County. At present the District collects 5¢ property tax per \$100 of assessed valuation, an amount which has been designated for local intra-Marin transit services. The bulk of this money has been forwarded to the Golden Gate Bridge, Highway, and Transportation District for the purpose of providing Marin with local transit service. Small amounts are reserved by the MCTD for special projects. The District was formed relatively recently but has never become a transit operator, functioning instead as a funding entity and a planner/promoter of local transit services.

3. The Santa Clara County Transit District (SCCTD)

was created by a vote of the electorate in 1972 and encompasses the entire County. The District is governed by a Board which is identical with the County Board of

Supervisors. The District was formed without explicit power of taxation. By utilizing outside funds (UMTA Capital Grants, Transit Development Act funds, etc), the District has been able to acquire, construct and operate transit facilities and control the charges for transit service as well as plan for the expansion of the system.

Initially the District moved to acquire the various private transit operators in the County to form the nucleus for an expanded system. The District can issue bonds subject to an election securing approval of 2/3 of the voters. Electoral approval is also required for the District to levy direct taxes. The District legislation also provides that if a fixed right-of-way transit system is extended into San Mateo or Alameda County, it would have to be compatible with BART and provide for unified management and operation.

4. The Alameda-Contra Costa Transit District (AC Transit) began operating in 1959, replacing the privately-owned Key System^{East} Bay and Trans-Bay service to San Francisco. The District is governed by a 7 person Board consisting of elected representatives of five "wards" of equal population and two at-large elected representatives, and covers the major urbanized areas of the East Bay Counties west of the Berkeley/Oakland Hills, i.e. from Hayward north to El Sobrante. The geographic scope of the District can be

expanded through annexation, which is dependent upon a 50% voter approval of the area proposed to be annexed. Annexation can be initiated either by a city or county legislative body or by petition. The District at present levies an ad valorem property tax and possesses the authority to issue bonds subject to the usual electoral stipulations.

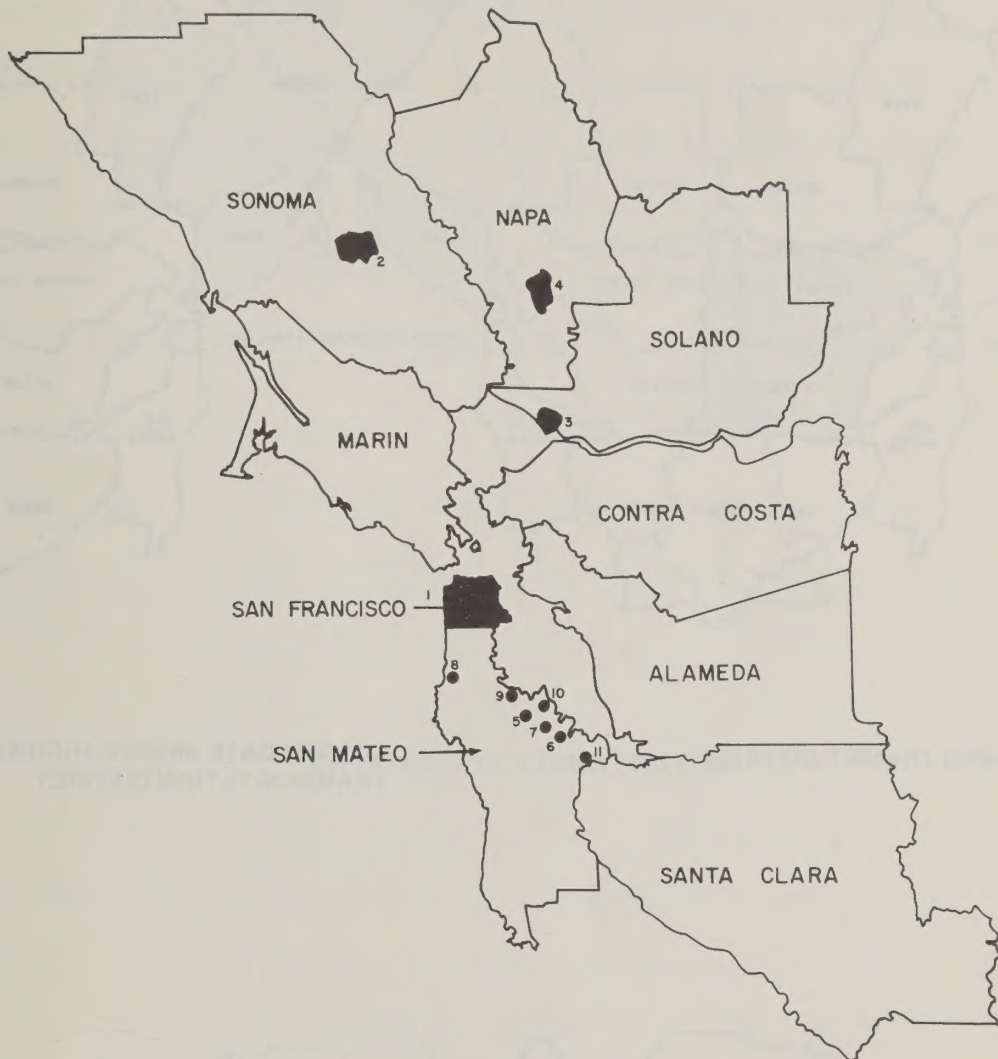
5. The Bay Area Rapid Transit District (BARTD) created in 1957, encompasses the Counties of Alameda, Contra Costa, and San Francisco, and is governed by a twelve-person Board of four individuals from each county, two each designated by the County Board of Supervisors and two each by the Mayor (of San Francisco) or the Mayoral Selection Committee (Alameda and Contra Costa). The District has the authority, subject to a vote of the electorate, to issue bonds for capital improvements and can provide rail transit facilities throughout its district area, as well as ancillary facilities critical to the operation of the trunk system such as express and feeder service where none now exists. A rather unusual feature of BART's legislation is that the system, once constructed and fully operative, must be self-supporting financially. This is, to be sure, a desirable objective but one which appears unrealistic given the experience of many other transit operators and in spite of the attempts BART has

made to maximize operating efficiency by using modern technology. In order to effect an annexation to the District, negotiation of the terms of an agreement and a subsequent vote by the electorate of the effected county would be required. The major consideration in negotiation would be the amount of obligation and manner of payment of any new county for the prior capital costs of the BART system.

6. Municipal Operators. The following cities operate transit systems generally only within municipal limits: San Francisco Municipal Railway, Santa Rosa, Napa, Vallejo, San Mateo, Redwood City, and San Carlos. These transit operations are governed by the elective legislation and executive bodies of their respective cities, and are subject to the same taxation, bonding, and other financial constraints as are their parent organizations. Municipal operator and transit district coverage is shown on the maps of Figures III-4, III-5, and III-6. Over the past several years there has been a trend toward the creation of public transit operators in the region, especially in San Mateo County, where various municipalities are in the process of initiating new public transit services. Included here are the cities of Pacifica, Burlingame, Foster City, and Menlo Park. Simultaneously over the past several years, formerly

Figure III-4

MUNICIPAL TRANSIT SYSTEMS

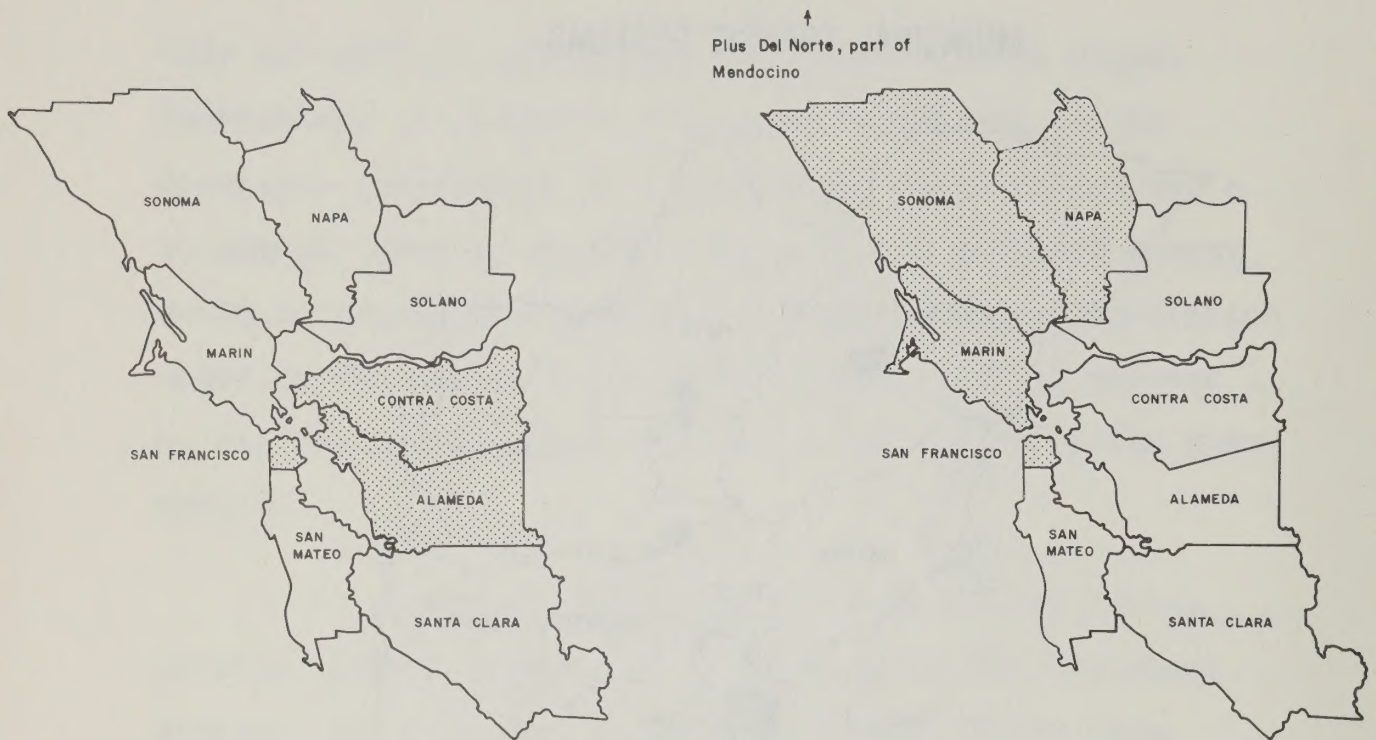


LEGEND

1. SAN FRANCISCO (MUNICIPAL RAILWAY)
2. SANTA ROSA
3. VALLEJO
4. NAPA
5. SAN MATEO
6. REDWOOD CITY
7. SAN CARLOS
8. PACIFICA*
9. BURLINGAME*
10. FOSTER CITY*
11. MENLO PARK*

* INSTITUTION OF SERVICE PENDING

TRANSIT DISTRICT BOUNDARIES



BAY AREA RAPID TRANSIT DISTRICT

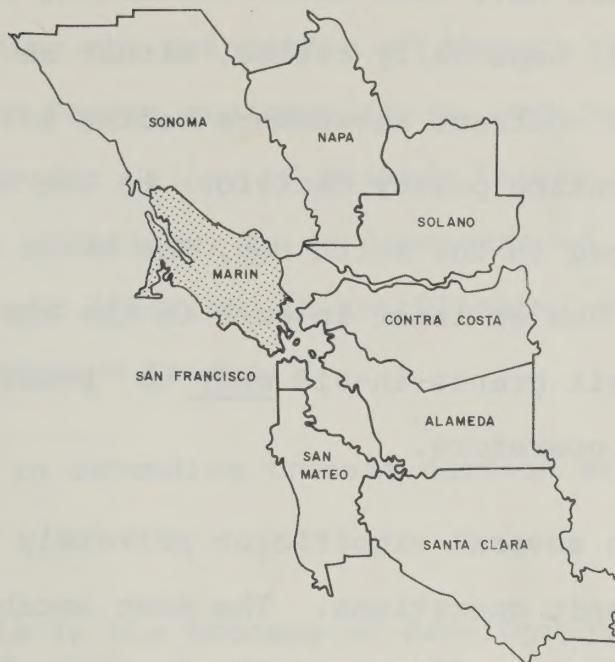
GOLDEN GATE BRIDGE, HIGHWAY AND
TRANSPORTATION DISTRICT



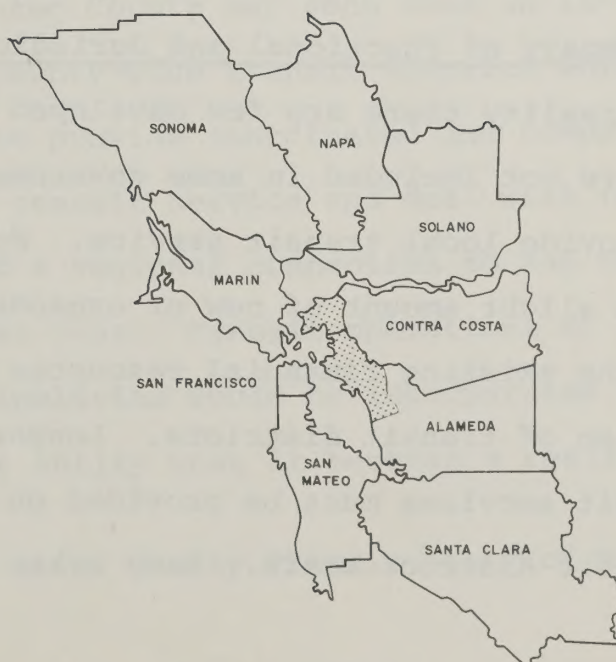
SANTA CLARA COUNTY TRANSIT DISTRICT

Figure III-6

TRANSIT DISTRICT BOUNDARIES



MARIN COUNTY TRANSIT DISTRICT



A-C TRANSIT DISTRICT

private operators have come under increasing control by public entities, especially cities, either as total buy-outs or through contract agreements ceding all but day-to-day operating policy decisions to the municipality. This has occurred in the North Bay, San Mateo and Santa Clara Counties due at least in part to the availability of public transit grants-in-aid only to "publicly owned or controlled" operators.

There do remain several significant privately owned and controlled transit operations. The most notable is the inter-county service offered by the Southern Pacific Railway between San Jose and downtown San Francisco. Also noteworthy is Western Greyhound Lines bus service offered on the Peninsula and in Contra Costa County. Inter-city bus service by private carriers is provided between other cities but not on a large scale.

7. Summary of Functional and Jurisdictional Coverage. In reality there are few developed areas of the region which are not included in some government entity which could provide local transit service. However, implementing even a slight amount of new or expanded service is often beyond the existing financial resources of individual cities and often of transit districts. Longer distance regional transit services must be provided on at least a county or transit district basis. Many urban areas within

transit districts do not receive local and feeder transit service, including the Tri-Cities of Alameda County, various Napa and Sonoma municipalities, and Central Contra Costa and the Amador Valley of Alameda County. Gaps exist between transit districts, as is demonstrated by the problem of transit districts in establishing service across the San Mateo-Hayward Bridge.

Current trends in extending transit service areas are as follows:

- 1 - BART is in the process of developing express bus service from its stations in Concord, Hayward, and El Cerrito to Pittsburg/Antioch, Livermore/Pleasanton and Pinole in advance of rail extensions which may not be built for 10 years;
- 2 - San Mateo County may soon vote on the creation of a county-wide transit district which will be able to provide coordinated and comprehensive local transit service and deal with the problem of a regional connection to San Francisco and San Jose. Transit operations of local municipalities would be incorporated into the larger entity when it becomes a reality.
- 3 - Santa Clara County Transit District and the

Golden Gate Bridge, Highway and Transportation District are planning for the expansion of bus service within their jurisdictions.

- 4 - The A-C Transit District may be providing service to the Tri-Cities area of Alameda and to the central area of Contra Costa County either by annexation to the District or by contractual agreement. A-C will also operate the express bus service for BART mentioned above.

Some other changes which may affect the regional transit system's institutional environment are:

- The Board of Directors of BART may become directly elected in the near future pending the outcome of a local referendum.
- The Marin County Transit District will ask the electorate for an increase in the 5¢/\$100 property tax rate during 1974 in order to provide more local transit service.
- The Santa Clara County Transit District may ask the voters for taxing authority which was not included in its initial formation in 1972.
- BART, which is unable to adhere to the legis-

lative mandate of meeting operating expenses from fare revenues, will have to shortly develop new revenue resources.

b. Service Characteristics of Transit Operators

1. San Francisco Municipal Railway - SF MUNI. SF

MUNI is the largest transit operator in the Bay Area in terms of patronage and equipment. Over 122 million passengers are anticipated for FY 1974 on a fleet of 550 diesel buses, 334 electric trolley buses, 105 electric street cars, and 39 cable cars. MUNI's service network comprises 702 round-trip line miles over 72 routes, with average annual service runs exceeding 25 million miles.

Taken in a regional context, these statistics represent 60% of the 9-county transit patronage, 40% of the region's equipment fleet and over 1/3 of the region's vehicle miles of service.

MUNI's transportation responsibilities are primarily two-fold:

- a) Serving intra-city movements between various activity centers and residential areas of San Francisco;
- b) Providing the vital feeder/distributor service for 5 regional carriers (BART, AC TRANSIT,

GGBHTD, Greyhound, Southern Pacific) within San Francisco. Virtually no operations are undertaken outside the city, except for some limited service into Daly City.

Whereas MUNI's absolute amount of service exceeds that of any other transportation agency in the region, its quality is variable. A large proportion of the equipment is old and uncomfortable. Maintenance and storage facilities are inadequate and the system has been short of personnel.

In response to this deteriorating situation, a multi-phase capital improvement program is now underway to replace most of the old equipment and upgrade operations and maintenance facilities. The elements of the program are discussed fully under Transit Financial Commitments in this section.

Other improvements to MUNI's service must await management initiatives with the support of San Francisco's Public Utility Commission (PUC), the Board of Supervisors, and the Mayor. The upcoming study of MUNI Operations, Management, and Marketing sponsored by San Francisco, MTC, and UMTA will address many of MUNI's most serious operating problems.

S.F. MUNI operates at a substantial deficit which is estimated to exceed \$30 million for the 1974 fiscal year. Funding for this deficit is provided by the Board of Supervisors from general city tax revenues. The current level

of funding support for MUNI's operations approximates \$1.40 per \$100 assessed valuation throughout San Francisco.

Included for the first time this fiscal year are federal revenue sharing funds for transit operations. Two other local sources contribute to operations deficits: 1) TDA tax funds primarily from S.F. County; 2) the Hetch Hetchy Power Department of the city's Public Utilities Commission.

Capital cost funding has not been so flexible. The City Charter stipulates that any public utility operating at a loss may receive only a minimal amount of general tax revenues for capital improvements. For MUNI, the result has been many years of continuing neglect with respect to maintenance and replacement needs.

In the late 1960's following electoral defeat of a General Obligation Bond Issue, the San Francisco Municipal Railway Improvement Corporation (SFMRIC) was created to enable the City to raise capital funds for transit improvements.

The Corporation is non-profit, and is empowered to float tax-exempt bonds (with the implied backing of the city) to raise capital. It then may buy equipment and facilities with this capital which it in turn leases to MUNI for an annual payment equal to the principal and interest obligations on the bond issue. In this way, the capital cost is supplied through lease payments which in turn are considered

to be an operations expense. With the advent of federal grant funds for transit, SFMRIC has become responsible for the receipt and expenditure of these funds as well.

Three additional sources of funds contribute to capital improvements: TDA funds from San Francisco County, the Hetch Hetchy Power Department, and city general tax funds. The city general tax funds provide the money for lease payments to SFMRIC which in effect represent a debt service expenditure.

Table III-3 indicates the source and use of funds for S.F. MUNI during the 1974 fiscal year.

2. Alameda-Contra Costa Transit District - AC Transit. The A-C Transit District furnishes local and express bus services to an East Bay area of about 175 square miles and, in addition, operates across the San Francisco-Oakland Bay Bridge to the Trans-Bay Terminal in downtown San Francisco. The service network consists of 2,960 round-trip line miles over 75 routes. Average annual service runs total over 27 million miles. AC Transit also maintains the largest fleet of diesel buses in the region, totalling 753 units. In FY 1974, AC Transit anticipates carrying over 53 million passengers. Taken together with S.F. MUNI, this represents nearly 87% of the total transit patronage in the 9-county region.

Table III-3

FY 1974 SUMMARY OF FUNDS APPLICATION

San Francisco Municipal Railway

(Millions of Dollars)

<u>Expenditures</u>		<u>Sources</u>					
		<u>Operating Revenue</u>	<u>City General 1. Funds</u>	<u>Bond Proceeds (SFMRIC)</u>	<u>T.D.A.</u>	<u>Other (Hetch Hetchy)</u>	<u>Federal Grants</u>
Transit Operations	59.02	26.02	30.44	-	1.46	1.10	-
Capital Improvement	38.44	-	2.69	3.80	2.75	3.40	25.80
Debt Service (SFMRIC)	<u>3.00</u>	<u>-</u>	<u>3.00</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
TOTALS:	<u>100.46</u>	<u>26.02</u>	<u>36.13</u>	<u>3.80</u>	<u>4.21</u>	<u>4.50</u>	<u>25.80</u>

1. Includes an element of Federal revenue sharing funds.

SOURCE: FY 1974 TDA claim.

District service may be divided into 3 sub-components:

- 1) eastbay local service which has the combined responsibility of providing intra-city movements as well as collector/distributor service for 18 BART stations (53 routes).
- 2) eastbay express service which continues to provide some inter-city transportation despite major cutbacks since BART's opening (8 routes).
- 3) transbay service which provides regional transportation services between eastbay points and San Francisco, and is intended to do so even after BART begins transbay operations, although at reduced schedules - (14 routes currently).

Since the express and transbay services offered by AC are their only profitable routes, the inextricable nature of BART and AC financial problems must be recognized. Evidence points to a strong spirit of cooperation thus far. Part E of this chapter reviews their program of coordination more closely. District management has the reputation for being very innovative in devising new ways to serve transportation needs while at the same time keeping existing operations moving smoothly. An excellent maintenance program is practiced and a relatively new fleet of buses is operated by the district as the result of an acquisition and replacement

program maintained since take-over of the Key System.

AC TRANSIT operates at a substantial and increasing deficit estimated to exceed \$12 million for fiscal 1974. AC's operating revenues cover approximately 56% of its operating costs. In contrast to MUNI's dependence on the San Francisco Board of Supervisors for an annually approved budget and tax allocation from the city general funds, AC Transit relies on a constant property tax within an established maximum rate levied for District use alone. This tax is currently set at 31.1¢/\$100 A.V. and is expected to accumulate nearly \$10 million in revenues for fiscal 1974.

Until recently, this property tax contribution was responsible for covering deficits from operations in addition to providing capital for equipment acquisition and debt service on outstanding long-term bonds. The passage of SB90 by the California legislature has for practical purposes frozen this rate, thus restricting AC's ability to absorb rapidly increasing costs.

Two major off-setting factors have alleviated this problem: the provision for TDA revenues beginning in fiscal 1973 and the increasing federal aid program for capital grants. The combination of these sources is estimated to provide an additional \$7.1 million for AC Transit in fiscal 1974.

TDA funds contribute to both unfunded operations deficits

and capital/debt service obligations. The federal funds contribute only to capital improvements. The net effect for fiscal 1974 shows that \$976,000 of anticipated operating needs are unfunded by these sources, thus necessitating a drawdown of AC's cash reserves.

Table III-4 indicates the source and use of funds for AC TRANSIT during the 1974 fiscal year.

3. Bay Area Rapid Transit District - BARTD. The BART system consists of rapid rail transit routes serving San Francisco, and via a tube beneath San Francisco Bay, the cities of Oakland, Hayward, Richmond, and Berkeley and suburban areas of Alameda and Contra Costa counties, providing service at a total of 34 stations over 71 miles of route. Bond issue approval by the electorate in 1962 provided funds to construct this system and the four-mile MUNI METRO Market Street-Twin Peaks line.

The 1974 services provided by BART have been restricted geographically and to limited hours and days of operation, primarily due to two reasons, both of which have to do with unanticipated start-up problems:

- 1) The system's automatic train control has not passed State PUC safety tests and is therefore preventing BART from merging trains from three eastbay lines onto one line leading to the

Table III-4

FY 1974 SUMMARY OF FUNDS APPLICATION
 ALAMEDA-CONTRA COSTA TRANSIT DISTRICT
 (Millions of Dollars)

Expenditures		Sources				
		<u>Operating Revenues</u>	<u>Property Taxes</u>	<u>T.D.A.</u>	<u>Cash Reserves</u>	<u>Federal Grants</u>
Transit Operations	29.07	16.32	9.67	2.10	0.98	-
Capital Improvement	4.06	-	-	1.40	-	2.66
Debt Service	<u>1.14</u>	<u>-</u>	<u>0.21</u>	<u>0.93</u>	<u>-</u>	<u>-</u>
TOTALS	<u>34.27</u>	<u>16.32</u>	<u>9.88</u>	<u>4.43</u>	<u>0.98</u>	<u>2.66</u>

SOURCE: FY 1974 TDA claim.

transbay tube and San Francisco. This has resulted in full operations on only one of four system lines (Richmond-Fremont) with a split operation maintained on the Concord-Daly City line (Concord trains go no further than Oakland, Daly City trains go no further than Montgomery Street in San Francisco.) Of the 34 stations in the system, this arrangement permits the operation of 32.

- 2) The BART cars are experiencing extraordinary maintenance problems especially with respect to electronic control components. Due to their erratic reliability in service and corresponding high levels of downtime for modification, the District is able to provide only limited numbers of cars for revenue service.

As a result, both the quantity and the quality of service made available to the public during FY 1974 has been less than anticipated. Patronage for the fiscal year is estimated to approach 15 million trips over 10.3 million vehicle miles of revenue service runs. This represents a considerably lower patronage than BART's FY 1976 "full operations" estimates (63 million passengers and 43 million vehicle miles.*) BART's current operations nonetheless

*Operating and Debt Service Budget - FY '74, San Francisco Bay Area Rapid Transit District

exceed the quantity of service offered by any public transit operator in the region other than S.F. MUNI or AC TRANSIT. Approximately 250 cars are estimated to be available for revenue service on BART's two partially activated routes as of June 30, 1974.

BART operations funding is the most serious financial crisis now facing the Bay Area's public transportation systems. There are several key reasons for both the immediacy and the magnitude of this problem. Due to reasons mentioned, transbay revenue service has been delayed into fiscal 1975. The resulting drastic reduction in fiscal 1974 operating revenue is the primary reason for the problem's unexpected suddenness. Of more long range importance, however, is the effect of escalating labor and materials costs. The net effect of this results in operating costs above anticipated levels of operating revenue.

Although concerted attempts were made to minimize costs, provision of rapid transit service by BART under the present or even increased fare structures is now recognized to require some operating support from public funds. This situation is especially difficult for BART because of the lack of existing alternative funding sources.

BART's deficit for fiscal 1974 is expected to exceed \$14 million, including extraordinary contributions from self-

insurance and capital reserve funds. This remaining funding need must be met from a combination of the permitted 5¢/\$100 assessed valuation property tax receipts, TDA contributions, operations fund reserves, and investment income. The use of all sources other than 5¢ property tax and TDA monies is indicative of a stop-gap program intended to keep the system operational until new sources of funding are developed.

Although BART's capital obligations have dwarfed its operating financial needs, the means by which capital and debt service costs are covered is relatively secure. Special tax assessments in the 3-counties are directly responsible for servicing long-term debt.

Assessment rates of 53.6¢, 58.7¢ and 60.9¢/\$100 assessed valuation are in effect during fiscal 1974 for Alameda, Contra Costa, and San Francisco Counties respectively. This rate includes 5¢ contributions to operations from each county with the remainder obligated to interest and principal payments on BARTD's General Obligation Bond Issue.

A special 1/2% retail sales tax in the 3 counties services BART's Capital Revenue Bond Issue and is rapidly repaying this outstanding debt. This tax automatically expires when the last of the \$150 million bonds are retired in 1976.

Surplus toll revenues from the 3 San Francisco Bay Bridges (S.F.-Oakland Bay Bridge, San Mateo-Hayward Bridge, Dumbarton Bridge) service the BART tube bonds.

On-going construction and system completion work for BART and its associated MUNI METRO obligations in San Francisco are funded out of programmed capital funds raised by the two bond issues. Federal grants-in-aid for capital improvements have gradually increased and for fiscal 1974 represent almost half of the funds being expended on work-in-progress.

T.D.A. revenues are also assisting BART in a crucial way by supplying the necessary local matching money with which the District is purchasing its final 100 cars. Table III-5 indicates the source and use of funds for BART during the 1974 fiscal year.

4. Golden Gate Bridge and Highway Transportation District (GGBHTD). The transit services provided by GGBHTD are in two modes: bus and ferry. The bus transit system began operation on January 1, 1972, and the ferry transit system was inaugurated in 1971.

Bus services in fiscal 1974 are provided utilizing 188 coaches on 29 express and local routes between San Francisco in the south and Santa Rosa in the north. Local bus service is provided for urbanized portions of Marin County on 10 routes. The remaining 19 routes are express service into

Table III-5

FY 1974 SUMMARY OF FUNDS APPLICATION

BAY AREA RAPID TRANSIT DISTRICT

(Millions of Dollars)

Expenditures		Revenues							
		Operating _{1.} Revenue	Property Tax	Sales Tax	Bond Proceeds	T.D.A.	Bridge Tolls	Reserves	Federal Grants
Transit Operations	38.20	23.78	3.76	-	-	0.73	-	9.93	-
Capital Improvement	148.03	-	-	-	74.47	4.87	-	-	68.69
Debt Service									
General Obligation	44.47	-	44.47	-	-	-	-	-	-
Sales Tax Revenue	33.91	-	-	33.91	-	-	-	-	-
Transbay Tube	<u>10.60</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>10.60</u>	<u>-</u>	<u>-</u>
TOTALS:	<u>275.21</u>	<u>23.78</u>	<u>48.23</u>	<u>33.91</u>	<u>74.47</u>	<u>5.60</u>	<u>10.60</u>	<u>9.93</u>	<u>68.69</u>

1. Includes extraordinary contribution from self-insurance and capital reserve funds.

Source: FY 1974 TDA claim.

and out of San Francisco, serving corridor transportation needs as far north as Santa Rosa with intermediate stops. GGBHTD service connects with the Trans-Bay terminal, but patrons board at on-street bus stops. This bus service is expected to operate 7.2 million vehicle miles in the 1974 fiscal year and carry approximately 7.3 million passengers.

Ferry service is presently offered on one vessel, the M/V Golden Gate, providing point-to-point scheduled service on 90 minute headways between the Ferry Building in San Francisco and downtown Sausalito. This one vessel is expected to carry approximately 1 million passengers during the fiscal year.

Both of GGBHTD's transit systems are currently undergoing major expansion programs. The elements of these programs are discussed fully under Transit Financial Commitments in this chapter.

GGBHTD's combined bus and ferry transit systems will carry nearly 8.3 million passengers during fiscal 1974, representing a substantial increase over the previous year. The ferry service patronage has remained stable over this period, while the major ridership increase is being experienced by the bus transit system. No other transit

operator in the Bay Area can claim a higher patronage growth rate except BART.

GGBHTD's primary transit responsibility to date has been the provision of trunkline bus service. Operating over essentially the same routes as Greyhound did before the bus transit service was inaugurated, GGBHTD is now carrying twice as many peak hour riders. It is believed that this large bus ridership increase has contributed to a slackened growth rate in the Golden Gate Bridge's automobile traffic.

GGBHTD's transit systems both operate at a deficit estimated to total \$5 million for fiscal 1974. The Bridge District has access to two outside resources specifically allocated to transit operations. The Bridge District has access to:

- 1) 5¢/\$100 A.V. property tax collections from the Marin County Transit District (MCTD) help to defray a portion of the costs associated with local service in Marin County. However, this is neither an adequate source to fully develop local service nor is it firmly committed to GGBHTD;

- 2) TDA funds collected in varying proportions from Marin, Sonoma, and San Francisco counties.

These two sources account for only \$880,000 in fiscal 1974

available for transit operations. The remaining operations need of over \$4 million for both bus and ferry operations is expected to come from bridge toll resources. Net bridge toll revenues from the Golden Gate span are estimated to be under \$4 million for the year. Together with investment income from nearly \$20 million in cash reserves, annual income on the bridge approximates \$5 million.

Capital cost funding must also depend heavily on bridge reserves. Bus system improvements are receiving funds to match federal grants from one outside source, TDA. This money satisfies all fiscal 1974 capital needs for bus improvements.

Ferry capital improvements have been set at over \$14 million, with federal grants covering approximately 2/3. This leaves the responsibility to raise \$4.8 million in matching funds on the Bridge District. This money is also assumed to come from bridge toll income and reserves.

Table III-6 indicates the source and use of funds for GGBHTD during the 1974 fiscal year.

5. Santa Clara County Transit District (SCCTD).

SCCTD has been in legal existence since July 1, 1972.

During their first fiscal year, three bus companies (including equipment and maintenance facilities) were purchased by the district: San Jose City Lines (SJCL),

Table III-6

FY 1974 SUMMARY OF FUNDS APPLICATION

GOLDEN GATE BRIDGE, HIGHWAY AND TRANSPORTATION DISTRICT

(Millions of Dollars)

<u>Expenditures</u>		<u>Revenues</u>				
		<u>Operating Revenue</u>	<u>Property Tax (MCTD)</u>	<u>T.D.A.</u>	<u>Bridge Tolls/ Reserves</u>	<u>Federal Grants</u>
Transit Operations						
Bus System	9.00	3.88	0.42	0.46	4.24	-
Ferry System	1.07	0.70	-	-	0.37	-
Capital Improvement						
Bus System	3.33	-	-	1.34	-	1.99
Ferry System	<u>14.38</u>	<u>-</u>	<u>-</u>	<u>0.04</u>	<u>4.76</u>	<u>9.58</u>
TOTAL:	<u>27.78</u>	<u>4.58</u>	<u>0.42</u>	<u>1.84</u>	<u>9.37</u>	<u>11.57</u>

SOURCE: FY 1974 TDA claim.

Peninsula Transit Lines (PTL), and a portion of Peerless Stage Lines. SJCL was a privately owned operator supported partially by the City of San Jose, and PTL was formerly a municipal operation of the City of Palo Alto. Peerless Stage Lines is a privately owned and operated bus company.

SCCTD is the most recently created "major" public transit operator in the region. Acting under the direct guidance of the County Board of Supervisors, it is responsible for the planning, development, and operation of transit services (both local and trunkline) throughout Santa Clara County. The population of this transit district (1.16 m) is exceeded only by that in the 3 county BART District (2.43 m).*

Fiscal 1974 local and express bus services are provided along 19 arterial routes in the county using 78 buses. Patronage is expected to total approximately 2 million trips over nearly 5 million vehicle miles of revenue service. On a regional basis, this represents 1% of total public transit patronage in an area comprising 21% of the regional population within a transit district.

Some effort has been made by SCCTD to interconnect with other parts of the region. A new service to the BART terminus in

*Actual 3-county population considered for TDA purposes to be receiving service from BARTD totals 2.08 million (including BART buses). Comparative service area populations: AC TRANSIT - 1.00 million; S.F. MUNI - 0.72 million; GGBHTD - 0.17 million.

Fremont (Alameda Co.) was begun during the year together with continued operations into East Palo Alto (San Mateo Co.) from Palo Alto. Dial-a-bus service is also being planned for 19 distinct zones in Santa Clara County, but is not expected to be in operation by June, 1974.

Unlike any of the other four major public transit operators in the Bay Area, SCCTD must rely on one local source of public contribution to transit activities, TDA tax funds. The District when authorized by the voters included no taxing authority to generate local funds because previous attempts to form a district with taxing powers were defeated at the polls. Since SCCTD is the only public transit operator in Santa Clara County with a service district including the entire county, all available TDA monies for local service use are available to the District.

The fiscal 1974 operating cost is projected to total \$5.75 million with estimated fare revenues of \$2.4 million. The TDA allocation for FY 1974 has been able to meet the remaining operations need.

According to SCCTD's FY 1974 TDA claim, capital expenditures for this same period are expected to exceed \$9 million. T.D.A. funds plus federal grants cover only \$5.9 million of these costs. It is not clear at this time what source of funding is intended to cover programmed improvements or

whether programmed improvements will be cut back. For the purposes of this section, it is assumed that additional funding will be obtained locally to satisfy SCCTD's budget requirements.

Table III-7 indicates the source and use of funds for SCCTD during the 1974 fiscal year.

6. San Mateo County Municipal Systems. Seven municipal bus operations are either functioning or are in the final stages of organization and equipment acquisition. These systems are sponsored by the cities of Redwood City, San Mateo, San Carlos, Menlo Park, Burlingame, Foster City, and Pacifica.

As of July 1974 all but Foster City and Pacifica anticipate having some service operational. A total of 20 buses covering 16 routes are planned by this date. Assuming no more than 1 million passenger trips on this combination of systems, it may be concluded that the level of public transit service being provided in a county of over one-half million residents is minimal.

Privately owned and operated transit services are depended upon in San Mateo County more heavily than anywhere else in the region, primarily for trunkline services. The Southern Pacific Transportation Company (SP) and Western Greyhound carry in the neighborhood of 10 million riders annually

Table III-7

FY 1974 SUMMARY OF FUNDS APPLICATION

SANTA CLARA COUNTY TRANSIT DISTRICT

(Millions of Dollars)

<u>Expenditures</u>		<u>Revenues</u>			
		<u>Operating Revenue</u>	<u>T.D.A.</u>	<u>Other Sources</u>	<u>Federal Grants</u>
Transit Operations	5.75	2.42	3.33	-	-
Capital Improvement	<u>9.16</u>	<u>-</u>	<u>2.31</u>	<u>3.26</u>	<u>3.59</u>
TOTALS	<u>14.91</u>	<u>2.42</u>	<u>5.64</u>	<u>3.26</u>	<u>3.59</u>

Source: FY 1974 TDA claim

along a corridor extending into San Francisco County to the north and Santa Clara County to the south. This figure is slightly greater than GGBHTD's corridor patronage, but far less than AC's and BART's eastbay/transbay corridor patronage. Significantly, both of these private companies incur substantial operating losses in providing transit services for the peninsula. Present annual deficits for SP and Greyhound are set at \$3.5 million and \$1.0 million respectively. Two other private transit companies exist in the county: Northgate Transit serving Daly City and C and C Transit Lines in Pacifica and vicinity. San Mateo County finds itself at a transit milestone during 1974 with plans to present a proposition calling for the formation of a county-wide transit district on the November ballot. The basic objectives of this district are similar to those of the SCCTD: planning, developing and operating local and trunkline transit services throughout the county. At the present time, it is planned to incorporate the capability for funding authority in addition to TDA, unlike SCCTD. Should this proposal receive a majority approving vote of the people, San Mateo County may well become one of the crucial growth areas in the region for public transportation services.

Based upon FY 1974 TDA claim estimates, the seven municipal operators expect a combined deficit of \$478,000. Scheduled capital improvements total \$1.13 million, primarily for the

acquisition of 38 buses. Delays have recently been encountered regarding this acquisition schedule, with the result that possibly no more than 9 new buses will be delivered before June of 1974.

TDA funds are presently the only available source of funding. Additional needs exist requiring as yet unspecified new revenue sources.

Table III-8 indicates the source and use of funds for San Mateo's municipal operators during the 1974 fiscal year.

7. North Bay Counties Municipal Systems. Three municipal bus operations have functioned in the 3 north bay counties of the Region throughout fiscal 1974. The City of Vallejo in Solano County owns and contracts for the operation of 10 buses over 8 routes, the City of Santa Rosa in Sonoma County owns and operates 6 buses over 6 routes, and the City of Napa in Napa County operates 2 buses over 2 routes. A total ridership of 760,000 trips on 570,000 vehicle miles is forecast for these three operators. Inter-city transit service is provided by private operators. Santa Rosa's system in Sonoma County is the only one that interconnects with a regional public transit carrier, the GGBHTD corridor buses into San Francisco. The remaining two municipal systems are strictly for the purpose of local circulation.

A combined operations deficit of \$178,000 is anticipated for fiscal 1974, with capital improvements planned at

Table III-8

FY 1974 SUMMARY OF FUNDS APPLICATION

SAN MATEO COUNTY MUNICIPAL OPERATORS

(Millions of Dollars)

<u>Expenditures</u>		<u>Revenues</u>			
		<u>Operating Revenue</u>	<u>T.D.A.</u>	<u>Other Sources</u>	<u>Federal Grants</u> *
Transit Operations	0.69	0.21	0.27	0.21	-
Capital Improvements	<u>1.13</u>	<u>-</u>	<u>0.62</u>	<u>0.51</u>	<u>-</u>
TOTALS:	<u>1.82</u>	<u>0.21</u>	<u>0.89</u>	<u>0.72</u>	<u>-</u>

*Federal grant funding has been suspended pending the outcome of the transit district referendum.

SOURCE: FY 1974 TDA claims

\$352,000. T.D.A. funds and federal capital grants cover all but \$35,000 of capital and operating needs. This additional funding is assumed to be supplied from some local sources.

Table III-9 indicates the source and use of funds for the 3 north bay municipal operators during the 1974 fiscal year.

c. Financial Commitments of Public Transit Operators

1. S.F. MUNI. The Municipal Railway is currently undergoing a 3-phase series of improvements to facilities and rolling stock. The main objective of these programs is to upgrade existing transit services. All are federal grant projects, funded on a 2/3 basis by UMTA with capital being made available at the programmed time of expenditure. A combination of general funds including federal revenue sharing, SFMRIC bond proceeds, TDA revenues, and Hetch Hetchy power revenues must provide adequate matching money for these federal grants in addition to covering all operating costs incurred net of fare revenues.

A brief summary of the three improvement programs follows:

Transit Equipment Program (TEP) - For the purpose of procuring 400 new diesel motor coaches, 210 refurbished electric trolley buses, 80 subway-surface rail transit cars, and 20 mini-buses.

Table III-9

FY 1974 SUMMARY OF FUNDS APPLICATION

3 MUNICIPAL OPERATORS - NORTH BAY

(Millions of Dollars)

<u>Expenditures</u>		<u>Revenues</u>			
		<u>Operating Revenues</u>	<u>T.D.A.</u>	<u>Other Sources</u>	<u>Federal Grants</u>
Transit Operations	0.42	0.24	0.16	0.02	-
Capital Improvements	<u>0.35</u>	<u>-</u>	<u>0.17</u>	<u>0.02</u>	<u>0.16</u>
TOTALS:	<u>0.77</u>	<u>0.24</u>	<u>0.33</u>	<u>0.04</u>	<u>0.16</u>

Source: FY 1974 TDA claims

Transit Improvement Program (TIP) - For the purpose of improving the ways and structures associated with all four modes of transit operated by MUNI including rail tracks and structures, bus and rail storage and maintenance facilities and cable car facility rebuilding and line extension.

Power Improvement Program (PIP) - For the purpose of providing electric power distribution to the rehabilitated trolley coaches and new transit cars as well as the undergrounding of all electric power feeder lines throughout the city.

The local matching money for the first two of these grant projects will be supplied primarily by SFMRIC and TDA contributions. Hetch Hetchy revenues will provide local money for PIP. Recently amendments to TEP and TIP as well as a fourth improvement program have been proposed by MUNI. The new program, System Improvement Program (SIP), and the amendments would cover cost increases and new project elements not contemplated in the original improvement programs. Major new improvements contemplated include additional MUNI METRO vehicles and facilities, motor coaches, and electric trolley buses.

The combination of these four programs as amended imply

improvements totaling over \$205 million for MUNI. Since these are mainly investments in replacement facilities and equipment, MUNI's operating cost forecasts need not be based on a significantly expanded system.

Assuming 2/3 federal funding on the original programs and 80% for program amendments and SIP available for capital improvements, the critical need is one of funding a rapidly mounting operations deficit. Even with city general tax contributions maintained at their current high level, funds available for operations fall nearly \$100 million short of the estimated 10-year need. This unmet need represents substantial new funding necessary to preserve the service at its present high level.

Table III-10 indicates the 10-year financial outlook for S.F. MUNI under existing circumstances.

2. A.C. TRANSIT. The A.C. Transit District is continuing its on-going bus acquisition program to modernize the vehicular fleet. This improvement program is not intended to expand AC's operating fleet or its service area. Rather, as with S.F. MUNI, the main objective is to upgrade transit services already provided in the existing transit district. Additional investment is being made in maintenance facilities.

Table III-10

10-YEAR FORECAST OF REVENUES AND EXPENDITURES

S.F. MUNI

(Millions of Dollars)

Revenues				Expenditures			
	<u>FY'75</u>	<u>→FY'84</u>	<u>10-YEAR</u> <u>TOTAL</u>		<u>FY'75</u>	<u>→FY'84</u>	<u>10-YEAR</u> <u>TOTAL</u>
Operations	25.72	25.57	255.97	Operations	58.55	97.26	759.64
City Gen'l Funds ¹	36.13	36.13	361.30	Capital Imp'v. ²	44.30	-0-	103.50
Bonds (SFMRIC)	5.31	-0-	32.35	Debt Service ⁴	3.00	4.00	35.10
T.D.A. ³	4.63	8.65	66.82				
Other (Hetch Hetchy) ⁵	4.50	1.10	14.40				
Federal Grants	29.54	-0-	69.09				
TOTAL REVENUES	105.83	71.45	799.93	TOTAL EXPENDITURES	105.85	101.26	897.70

NOTES

1. Assumes maintained level of FY 1974 city-general fund contributions throughout 10-year period.
2. Does not include S.I.P.
3. Assumes a 5.8% per year rate of increase in TDA collections between FY 78 and FY 84.
4. Assumes lease payments to SFMRIC (Debt Service) to average \$4.0 million annually between FY 78 and FY 84.
5. Assumes operations funding aid from Hetch Hetchy averages \$1.1 million annually throughout 10-year period, in addition to FY '75 capital contributions of \$3.4 million.

See Appendix Tables 9, 10, 15 and 16 for detailed data.

A total of 380 buses are proposed for acquisition by AC for the 5 year period FY 74 through FY 78. All vehicles will replace older equipment. Whereas 2/3 federal grants (UMTA) have been secured for the first 3 years of this program, the final 2 years have not yet received grant approval. It is likely that the latter years' acquisition programs will receive 80% funding assistance from UMTA. The total of these programmed improvements equals \$21.257 million. Taking federal grants approved plus 80% federal financing of the fiscal 1977 and 1978 improvement programs, total federal participation could equal \$15.561 million.

The modernization program is based on no expansion of the AC Transit service district even though the nature of AC service is expected to change significantly, thus affecting forecasts of operating costs and revenues. The advent of BART in the eastbay and transbay corridors will severely reduce AC's trunkline service while increasing its feeder/distribution responsibilities. The replacement of some high revenue Trans-Bay service by increased feeder/distributor service is a major factor underlying AC's estimate of rapidly increasing operating deficits. The most immediate need is funding this increasing deficit since existing resources should be able to provide the local share for proposed capital improvements on a 20% basis.

Table III-11 indicates the 10-year financial outlook for AC TRANSIT under existing circumstances.

3. BARTD. BARTD's financial commitments during the 10-year period exceed those of any public transit agency in the Bay Area, totaling over \$1.5 billion in terms of projected operating, capital and debt service needs.

Capital and related debt service obligations far outweigh operating needs in terms of dollar amounts. Approximately \$126 million in construction work and equipment acquisition is programmed for the period through FY 77. This represents completion of the BART system together with the Market Street subway for MUNI METRO. Debt service obligations on outstanding bond issues equals \$607 million over the 10-year period, representing the heaviest obligation of all.

As was stated in the previous section to this chapter, BART's interest and principal repayment on long-term debt is secured by committed sources of tax and toll funding applicable to each bond issue. The bulk of capital funding is derived, in turn, from these issues. Federal grants have also become a major source of funding and represent nearly \$86 million in anticipated funding over BART's remaining scheduled capital improvement program.

On the whole, this information would indicate a substantial

Table III-11

10-YEAR FORECAST OF REVENUES AND EXPENDITURES

A.C. Transit

(Millions of Dollars)

Revenues				Expenditures			
	FY'75 → FY'84 :		10-YEAR TOTAL		FY'75 → FY'84 :		10-YEAR TOTAL
Operations	15.17	19.69	175.06	Operations	30.35	62.93	446.96
Prop. Taxes ¹	10.47	16.07	133.33	Capital Imp'v.	2.21	-0-	17.20
T.D.A. ²	5.09	9.92	75.30	Debt Service ⁴	1.16	-0-	9.35
Federal Grants ³	1.47	-0-	12.90				
TOTAL REVENUES	<u>32.20</u>	<u>45.68</u>	<u>396.59</u>	TOTAL EXPENDITURES	<u>33.72</u>	<u>62.93</u>	<u>473.51</u>

NOTES

1. Assumes a 4% per year rate of increase in assessed valuations between FY '78 and FY '84.
2. Assumes a 6.5% per year rate of increase in TDA collections between FY '78 and FY '84.
3. Assumes 80% Federal grants for FY '77 and '78 improvements.
4. Assumes debt service in FY '79, '80, '81 equals \$1.41 m, \$1.58 m, and \$1.62 m respectively.

See Appendix Tables 9,10,11 and 12 for specific data.

funding base. However, under existing constraints, only \$45 million of these resources may be directly allocated to operations over the 10-year period. This is due to restrictions incorporated into BART's original legislation, allowing only 5¢/\$100 property tax revenues to contribute to operations.

Additional operations funding has become available in relatively small amounts from the TDA source and BART's various reserve funds (most of which are tapped to meet the FY '74 operating deficit). Reserves must be considered as extremely limited sources of funding. Even with 100% of estimated TDA funds applied to operations after FY 79, this combination of resources falls \$260 million short of anticipated operating deficits, over 10 years, with the shortfall in funding projected to materialize by early FY 1975.

The overall financial situation of BART is therefore one of adequate capital funds for present commitments, but very severe operating revenue shortages. The resulting deficiency necessitates quick action to implement totally new revenue-generating mechanisms specifically for operations.

Table III-12 indicates the 10-year financial outlook for BART under existing circumstances.

Table III - 12

10-YEAR FORECAST OF REVENUES AND EXPENDITURES

BART

(Millions of Dollars)

Revenues				Expenditures			
	FY'75	FY'84	10-YEAR TOTAL		FY'75	FY'84	10-YEAR TOTAL
Operations	31.70	45.94	397.99	Operations	52.91	103.04	768.47
Prop. Tax ¹	49.33	57.97	540.14	Capital Imprv.	93.33	-0-	126.24
Sales Tax	36.02	-0-	61.51	Debt Service			
Bond Proceeds	28.18	-0-	32.59	G.O.	45.48	52.72	495.50
T.D.A. ²	5.50	8.39	61.09	Rev.	36.02	-0-	61.51
Bridge Tolls	50.30	-0-	50.30	Tube ⁴	50.30	-0-	50.30
Reserves ³	10.84	-0-	10.84				
Fed. Grants	60.45	-0-	85.99				
TOTAL REVENUES	<u>272.32</u>	<u>112.30</u>	<u>1,240.45</u>	TOTAL EXPENDITURES	<u>278.04</u>	<u>155.76</u>	<u>1,502.02</u>

NOTES

1. Funds generated only for G.O. Bond Service and 5¢/\$100 operations assistance.
2. Assumes TDA revenues increase by 6.5% annually from FY '78 to FY'84.
3. Contribution from capital funds in FY '75 of \$10.84 million.
4. Assumes 1980 term bonds are paid off in March of 1975.

See Appendix Tables 9,10,13 and 14 for specific data.

4. Golden Gate Bridge, Highway, and Transportation District (GGBHTD). GGBHTD also finds itself in the middle of a major improvement program. However, unlike MUNI and AC, GGBHTD's program signals a significant expansion of its transit services.

Two modes of corridor transit are involved:

The bus transit system. Currently operating a fleet of 188 vehicles, is scheduled to expand over the 5-year period through FY 78 by 62 buses for a system total of 250 vehicles. These improvements are presently valued at over \$5.5 million, and it is assumed that federal grants will cover a large portion of this expense.

The ferry transit system, with only one vessel operating during FY '74 is acquiring 3 additional high speed ferryboats each with a 750 passenger capacity for service between San Francisco and two terminals in Marin County, Larkspur and Sausalito. Delivery of the first of these vessels is expected in June 1974, with the last one scheduled by February 1975. Construction efforts are also planned for related terminal facilities at the Larkspur site, and in Sausalito and San Francisco.

Based on FY 74 T.D.A. claim information, this expansion represents \$17.5 million in programmed expenditures over the 5-year period FY 74 through FY 78. Original data indicated major ferry system capital expenditures would take place prior to FY 75. Implementation progress has been delayed, however, making future cost adjustments almost certain.

Current planning foresees a \$37 million transit system functioning for the District by the end of FY 1976. This significant expansion of public transportation service implies sharply higher operating deficits. MCTD 5¢ tax monies, TDA revenues and surplus Golden Gate Bridge toll revenues are the only outside sources of funds presently available for District needs, with bridge tolls by far the most significant source.

Despite an increase in toll rates for the Golden Gate Bridge effective March 1, 1974, the prospect of decreasing net bridge income available for transit in the face of rising operations and maintenance costs suggests that bridge revenues should not be regarded as the sole major reliable source of long-term transit funding for the District.

Table III-13 indicates the 10-year financial outlook for GGBHTD under existing conditions.

Table III - 13

10-YEAR FORECAST OF REVENUES AND EXPENDITURES

GGBHTD

(Millions of Dollars)

Revenues				Expenditures			
	FY'75 → FY'84 :		10-YEAR TOTAL		FY'75 → FY'84 :		10-YEAR TOTAL
Operations				Operations			
Bus	3.56	9.53	65.85	Bus	9.96	20.30	147.80
Ferry	1.73	3.58	30.08	Ferry	3.14	7.42	55.56
Prop. Tax ¹ (MCTD)	0.45	0.69	5.73	Capital Imprv.			
T.D.A. ²	1.50	3.64	26.74	Bus	0.27	-0-	2.23
Bridge Tolls ³	5.71	4.61	47.20	Ferry	2.48	-0-	3.12
Fed. Grants	1.65	-0-	3.12				
TOTAL REVENUES	<u>14.60</u>	<u>22.05</u>	<u>178.72</u>	TOTAL EXPENDITURES	<u>15.85</u>	<u>27.72</u>	<u>208.71</u>

NOTES

1. Property tax collections @ 5¢/\$100 from MCTD are assumed to increase by 4% per year between FY '78 and FY '84.
2. TDA funding is assumed to increase by 6.5% annually from FY '78 to FY '84.
3. It is assumed the FY 1974 level of operating assistance supplied from bridge tolls is maintained throughout the period (\$4.61 million annually). A FY '75 contribution to proposed capital improvement of \$1.1 million is also indicated. Whether toll revenues and reserves can adequately supply a 10-year total of \$47.20 million is open to question.

See Appendix Tables 9, 10, 17 and 18 for specific data.

5. Santa Clara County Transit District (SCCTD).

SCCTD is the only major transit agency projecting a surplus operating budget in their FY 74 TDA claims for the period FY 75 through FY 78. However, extrapolation of system operating needs indicate a cumulative ten-year deficit of \$73 million. SCCTD expects TDA revenues, their sole outside source of funding, to satisfy this cost-revenue gap. This assumption does not provide for use of TDA funds for regional transit services.

A series of capital improvements programmed through FY 78 anticipates over \$56 million in expenditures. This sum includes complete acquisition of the district's planned 200 unit bus fleet, together with early expenditures on an as yet unspecified fixed guideway mode of transit.

Federal grant funding for these improvements is projected by SCCTD in their FY 74 TDA claim to cover as much as 95% of annual improvements. This share may well prove optimistic. Further, undefined local sources are implied in addition to anticipated TDA funding to match federal grants.

For the period beyond FY 1978, only a 100% allocation of available TDA monies will satisfy the projected deficit from operations. Any capital improvements during this period will require entirely new sources of funding.

The total projected revenues for SCCTD (including a very high level of federal grant funding) imply adequate resources to meet programmed operations and improvements through FY 78. A stabilized operation over the following 6-years could also be funded from the TDA source on this basis, assuming no investment in regional transit service. Table III-14 indicates the 10-year financial outlook for SCCTD under existing circumstances.

6. San Mateo County Municipal Operators. The seven municipal operators described in the previous section to this chapter have programmed a total of \$390,000 in capital improvements. This expenditure represents acquisition of buses and related support facilities. 10-year operation of these 7 systems is further estimated to cost nearly \$17 million, leaving an operating deficit of \$12 million.

Each municipality has projected an estimate of TDA funds to become available through FY 78. These projections, when extrapolated to FY 84, indicate an unfunded deficit for both operations and capital cost elements of approximately \$2 million. With some adjustment in allocation procedures, TDA funds from the county could almost certainly cover this shortfall.

However, the county's public transit situation is currently in a state of flux. The pending ballot regarding formation

Table III-14

10-YEAR FORECAST OF REVENUES AND EXPENDITURES

SCCTD

(Millions of Dollars)

Revenues				Expenditures			
	FY'75 →	FY'84 :	10-YEAR TOTAL		FY'75 →	FY'84 :	10-YEAR TOTAL
Operations	3.26	8.39	56.34	Operations	7.42	19.20	129.68
T.D.A. ¹	6.20	12.06	90.96	Capital Imprv. ²	5.60	-0-	56.33
Fed. Grants	1.61	-0-	45.12				
TOTAL REVENUES	11.07	20.45	192.42	TOTAL EXPENDITURES	13.02	19.20	186.01

NOTES

1. Assumes a 6.5% per year growth rate in TDA revenues between FY '78 and '84. The 10-year total represents approximately 75% of all Santa Clara County TDA collections between FY '75 and FY '84 as projected by MTC.
2. Includes major expenditures for fixed guideway rapid transit in FY '77 and FY '78 as proposed by operator.

See Appendix Tables 9,10,19 and 20 for specific data.

of a county-wide transit district in November of this year significantly affects any attempt to project financial needs over the next 10-years. Approval of this ballot is expected to carry with it the commitment to implement some degree of county wide local bus service.

If the district is formed and commences large scale transit operations, or if a proliferation of municipal requests for funding of their own systems takes place, it is estimated that TDA will become inadequate as the sole source of local funding.

Table III-15 indicates the 10-year financial outlook for the 7 municipal operators currently existing in San Mateo County.

7. North Bay Municipal Operators. No significant funding deficiencies are foreseen at the present time for the 3 municipal operators in the north bay counties of the region if current levels of service are continued. Napa City, Santa Rosa and Vallejo have programmed a total of \$310,000 in capital improvements over the period through FY 78, comprising 4 new buses for Napa City, and facility upgrading programs for all three systems. Operations costs over the 10-year period are estimated to total 6.8 million for the 3 systems.

The combined financial need for capital and operations

Table III-15

10-YEAR FORECAST OF REVENUES AND EXPENDITURES

SAN MATEO COUNTY MUNICIPAL OPERATORS

(Millions of Dollars)

Revenues				Expenditures			
	FY'75 →	FY'84	10-YEAR : TOTAL		FY'75 →	FY'84	10-YEAR : TOTAL
Operations	0.38	0.56	4.63	Operations	1.21	2.32	16.71
T.D.A. ¹	0.88	1.37	10.68	Capital Imprv.	0.08	-0-	0.45
Federal Grants ²	-0-	-0-	-0-				
TOTAL REVENUES	<u>1.26</u>	<u>1.93</u>	<u>15.31</u>	TOTAL EXPENDITURES	<u>1.29</u>	<u>2.32</u>	<u>17.16</u>

NOTES

1. A 6.5% per year growth rate in TDA tax collections is assumed between FY '78 and FY '84.
2. Federal grant funding has been suspended pending completion of Local Bus Study and the outcome of the transit district referendum.

See Appendix Tables 9,10,21,22,23,24,25,26 and 27 for specific data.

is fully satisfied by projections of TDA funding together with anticipated federal grant funds. It is therefore assumed that adequate local funding is available to maintain these 3 systems over 10 years at their present levels of service. Table III-16 indicates the 10-year financial outlook for the 3 municipal operators currently existing in Sonoma, Solano, and Napa Counties.

(text continued on page following table)

Table III-16

10-YEAR FORECAST OF REVENUES AND EXPENDITURES

NORTH BAY MUNICIPAL OPERATORS

(Millions of Dollars)

Revenues				Expenditures			
	<u>FY'75</u>	<u>→FY'84</u>	<u>10-YEAR</u> <u>TOTAL</u>		<u>FY'75</u>	<u>→FY'84</u>	<u>10-YEAR</u> <u>TOTAL</u>
Operations	0.31	0.41	3.61	Operations	0.54	0.87	6.79
T.D.A. ¹	0.37	0.51	4.03	Capital Imprv.	0.12	-0-	0.31
Fed. Grants	0.07	-0-	0.11				
	<u> </u>	<u> </u>	<u> </u>		<u> </u>	<u> </u>	<u> </u>
TOTAL REVENUE	0.75	0.92	7.75	TOTAL EXPENDITURES	0.66	0.87	7.10

NOTES

1. A 6.5% per year growth rate in TDA tax collections is assumed between FY '78 and FY '84.

See Appendix Tables 9,10,28,29 and 30 for specific data.

8. Summary of Transit Financial Situation. Financial commitments for both continued transit operations and proposed improvements were estimated by each transit operator for a 5-year period through FY 78 consistent with FY 74 TDA claim requirements. Operational cost estimates reflect anticipated increases in labor and materials expenses coinciding with continued operation of the existing transit services described in the preceding sections. In addition, these estimates assign an increased operating cost associated with those improvements or expansions of service proposed to be implemented by each operating agency during the 5-year planning period of FY 74-78.

In order to establish a longer-range cost base for continued operation of this "existing + committed transit system" (E + C System), MTC has projected operating costs for an additional 6 years using growth trends established by the TDA estimates. The resulting 10-year operating cost forecast (FY 75-84) lays the foundation upon which all proposals for transit development must rest. Inability to adequately fund this level of need precludes any further improvement of the Regional System. (See Appendix Table 9).

This section described the E + C System's 10-year operations in conjunction with proposed capital improvements and debt commitments in order to show the projected financial status

Table III-17

10-YEAR FORECAST OF REVENUES AND EXPENDITURES

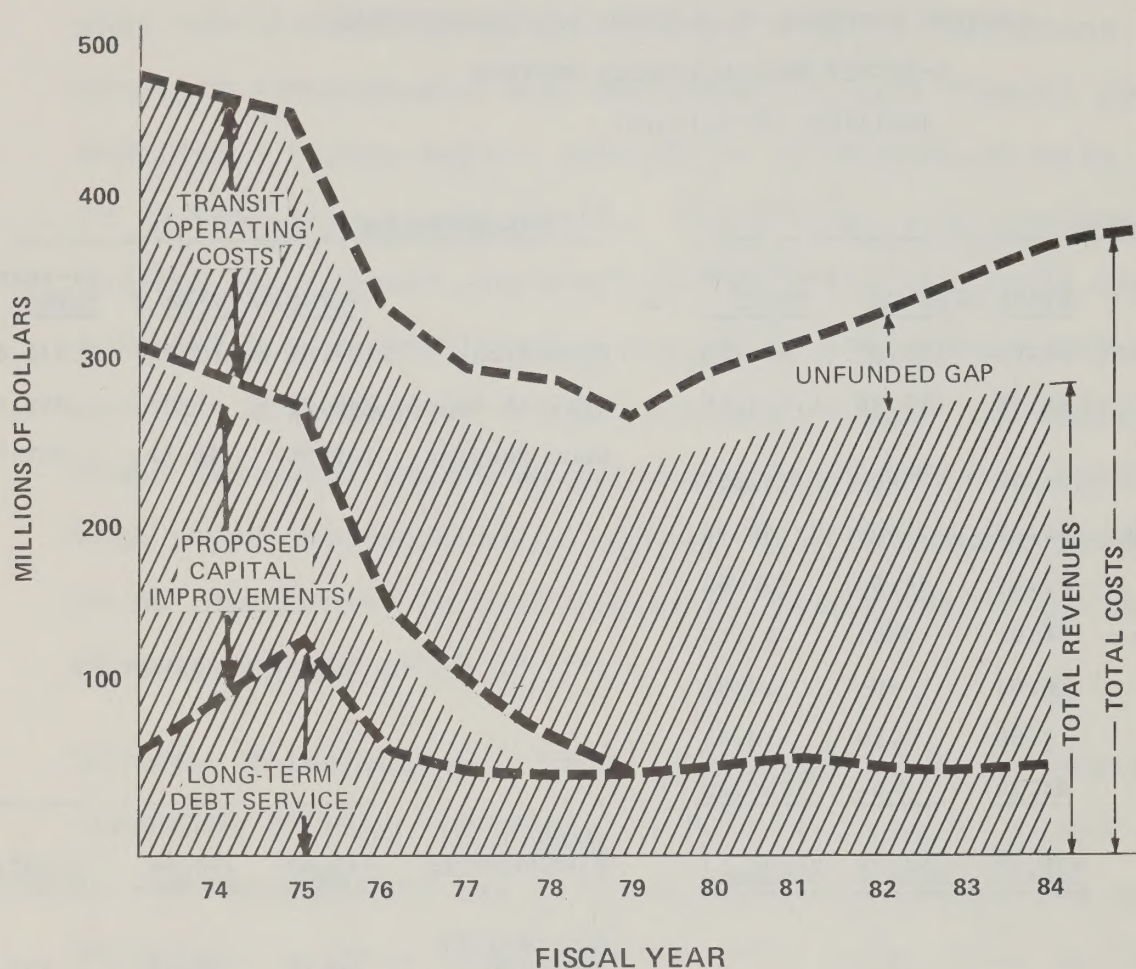
9-COUNTY REGION TRANSIT SYSTEMS

(millions of dollars)

Revenues				Expenditures			
	<u>FY'75</u>	<u>→ FY'84</u>	<u>10-YEAR</u> <u>TOTAL</u>		<u>FY'75</u>	<u>→ FY'84</u>	<u>10-YEAR</u> <u>TOTAL</u>
Operations	81.83	113.67	989.53	Operations	164.08	313.34	2,331.61
Prop Tax/ Genl. Funds	96.38	110.86	1,040.50	Capital Imprv.	148.39	-0-	309.38
Sales Tax	36.02	-0-	61.51	Debt Service	135.96	56.72	651.76
Bond Proceeds	33.49	-0-	64.94				
T.D.A.	24.17	44.54	335.62				
Bridge Tolls	56.01	4.61	97.50				
Reserves	10.84	-0-	10.84				
Other Local	4.50	1.10	14.40				
Fed. Grants	<u>94.79</u>	<u>-0-</u>	<u>216.33</u>				
TOTAL REVENUE	<u>438.03</u>	<u>274.78</u>	<u>2,831.17</u>	TOTAL EXPENDITURES	<u>448.43</u>	<u>370.06</u>	<u>3,292.75</u>
				NET DEFICIT POSITION	<u>10.40</u>	<u>95.28</u>	<u>461.58</u>

See preceding operator tables for detailed information.

10-YEAR FORECAST OF TRANSIT REVENUES AND EXPENDITURES



PROJECTED FUNDING FROM
EXISTING REVENUE SOURCES

NOTE: Assumes stabilized level of F.Y. 1974 aid for transit operations from general funds / property taxes and Golden Gate Bridge tolls. T.D.A. Funds for F.Y. 1974-78 are applied in the amounts estimated by each operator to be available for operations. F.Y. 1978-84 indicate *full* T.D.A. fund allocation to operations.

of each operator as well as the Region as a whole vis a vis existing resources. Table III-17 and Figure III-7 depict in numerical and graphic terms respectively the magnitude of these financial needs and the shortfall of existing resources corresponding thereto.

PART B

Social, Environmental, and Demographic Summary of the BAY AREA. In 1970 there were 4,636,000 persons residing in the nine Bay Area counties, concentrated largely near San Francisco Bay. The population for each county reported by the U.S. Census over several decades is shown in Table III-18. The Bay Area since World War II has absorbed much population growth as did the State of California as a whole. The fastest growing counties have been Santa Clara, Marin and Contra Costa, all of which have experienced rapid suburbanization. Only San Francisco lost population since 1950, at which time it contained little vacant land and has instead undergone redevelopment of a primarily non-residential character.

Residential development in the Bay Area over the last several decades has been predominantly suburban low-density. Higher density development had occurred earlier because limited transportation facilities and the concentration of jobs in a few commercial and industrial centers necessitated relatively close proximity of employees to offices and

Table III-18

POPULATION GROWTH OF BAY AREA COUNTIES

<u>COUNTY</u>	<u>1950 Pop.</u>	<u>1960 Pop.</u>	<u>% Change</u>	<u>1970 Pop.</u>	<u>% Change</u>	<u>% of Region Pop. in 1970</u>
Alameda	740,315	908,209	22.7	1,073,184	18.1	23.2
Contra Costa	298,984	409,030	36.8	558,389	36.6	12.1
Marin	85,619	146,820	71.5	206,038	40.4	4.5
Napa	46,603	65,890	41.4	79,140	19.6	1.7
San Francisco	775,357	740,316	-4.5	715,674	-3.3	15.4
San Mateo	235,659	444,387	88.6	556,234	25.2	12.0
Santa Clara	290,547	642,315	121.1	1,064,714	65.7	23.0
Solano	104,833	134,597	28.4	169,941	26.1	3.7
Sonoma	103,405	147,375	42.5	204,885	38.7	4.4
REGION	2,681,322	3,638,939	35.6	4,628,199	27.1	100.0

Source: U.S. Census, 1950, 1960, 1970

industries. The continued improvement of transportation service--especially of the highway system--allowed a significant extension of the journey to work and the ensuing creation of many "bedroom" communities economically tied to job centers in the older urban areas. In some cases jobs (especially in newer types of industry which were not tied to fixed site characteristics or which were not land-intensive) also decentralized, further accelerating the dispersal of residential population. The current residential population densities of the nine Bay Area counties are shown in Table III-19. San Francisco and Oakland exhibit by far the highest residential density, while densities taper off with distance from these older urban areas.

The future characteristics of urban and suburban development in the region are uncertain. There has been a growing trend toward the construction of multiple-family dwellings, leading to an increase of residential densities in even some outlying communities. There has also been a trend toward limiting unhampered suburban expansion in the interest of preserving open space, decreasing negative environmental side-effects, and economizing on the provision of public utilities (sewers, water, transport, schools, etc). As of yet, however, suburban development has declined only in percentage of growth.

Table III-19

POPULATION DENSITY OF BAY AREA COUNTIES - 1970*

<u>COUNTY</u>	<u>POPULATION DENSITY</u>
Alameda	20.7
Contra Costa	11.8
Marin	12.0
Napa	12.9
San Francisco	75.8
San Mateo	17.6
Santa Clara	18.6
Solano	25.8
Sonoma	15.6

* 1970 Population divided by net residential acres
(excludes all vacant, commercial, agricultural,
industrial, etc. land uses)

Source: U.S. Census, 1970; PLUM Forecast Land Use,
MTC/ABAG, 1970.

There is much controversy over where new development will locate in the Bay Area. It appears as if high-density residential development is locating in areas which already contain many multiple-family dwellings whereas suburbanization is proceeding at the margins of existing suburbs. In particular question is the future of the North Bay Counties--Sonoma, Napa, and Solano--which appear to be likely subjects for much new low-density development unless constraints not now foreseen intervene. Suburban growth can also be expected in Central Contra Costa and Alameda Counties.

Employment in the Bay Area has increased roughly parallel to population growth. Table III-20 shows the employment in each Bay Area County and each County's share of the regional total. In general, jobs have decentralized markedly although some categories of employment continue to be quite centralized in the region's central cities (e.g. the financial institutions of downtown San Francisco). San Francisco, once the predominant employment center of the region, now accounts for only around 15% of the region's jobs. In particular, much manufacturing activity has left San Francisco for suburban locations. And, much of the growth of commercial activity has occurred in the suburbs.

Portions of the region differ greatly in terms of population

Table III-20

LOCATION OF EMPLOYMENT IN BAY AREA COUNTIES, 1970

	<u># OF JOBS</u>	<u>% of REGION's JOBS IN THIS COUNTY</u>	<u>% of REGION's POPULATION IN THIS COUNTY</u>
ALAMEDA	469,697	23.8	23.2
CONTRA COSTA	142,840	7.2	12.1
MARIN	54,632	2.8	4.5
NAPA	26,793	1.4	1.7
SAN FRANCISCO	504,490	25.8	15.4
SAN MATEO	223,504	11.3	12.0
SANTA CLARA	432,772	21.8	23.0
SOLANO	56,515	2.9	3.7
SONOMA	64,269	3.3	4.4
TOTAL	1,975,511	100.0	100.0

Source: U.S. Census, 1970

characteristics, with the lowest income groups of the population being concentrated in the older central cities where housing is cheapest. Minority groups show a similar geographic distribution: large black communities are found in San Francisco, Oakland, Berkeley, and Richmond while Spanish-surname groups are concentrated in Southwest Alameda County, Santa Clara County and in San Francisco's Mission District. Significant pockets of low-income individuals are also located in rural parts of the region, often tied to agricultural employment, such as the Spanish-surname populations of outlying Santa Clara and Sonoma Counties. Recent trends indicate a growing disparity between the average income of different parts of the region, with the poorer areas becoming still poorer relative to the average income of the region, the richer areas growing richer.

Air quality is the major outward environmental characteristic affected by transportation. While the air quality of the Bay Region does not approach the degree of degradation prevalent in Los Angeles, it has nevertheless deteriorated in the past decade to the point where some monitoring stations indicated in 1971 and 1972 over 40 violations of the oxidant and carbon monoxide standards annually. Some evidence of improvement in air quality has been noted in the past several years, but since air quality standards have become progressively more stringent, major environmental improvement

effort must still be made. Transportation, furthermore, is the area where most effort must be placed, since it is estimated that this pollutant emission sector contributes around 90% of the carbon monoxide, 60% of the hydrocarbons, and 68% of the oxides of nitrogen to the total pollutant load.

Air quality conditions in the Bay Area tend to be rather localized, often inordinately affecting areas which have not directly emitted pollutants. The air movements of the area generally bring pollutants from San Francisco and the West Bay to nest in pockets such as the Amador Valley, San Jose and the South Bay. As a result, approaches to improving air quality have had to be formulated on at least a regional, and sometimes on a statewide basis.

PART C

Regional Travel Characteristics. Travel patterns are determined by the spatial distribution of people and their residences, non-residential establishments, activities and by the transportation services which link them together. The most exhaustive picture of the region's travel patterns was made possible by the surveys of the Bay Area Transportation Study Commission in 1965, when up to 2% of the regional population was contacted. Travel conditions which were determined in that year showed the following:

--4.1 million people residing in the nine-county region made 12 million person trips on an average weekday; the largest single purpose of trips was from home to work and the reverse, accounting for 22.2% of total person trips (See Table III-21).

--On the average weekend day the number of person trips was similar to the average weekday, as recreation, shopping, social, etc. trips made up for the decline in work and school trips.

--The private automobile accommodated the large majority of person trips in all trip purpose categories and on all days of the week (see Table III-22). Public transit played its largest role in accomplishing school trips (school buses) and home-to-work trips.

Some general trends in travel patterns are discernible from the U.S. Census as reflected in Table III-23 and III-24. This data indicated that for the journey from home to work, which has been the trip purpose where public transit had been used the most (excluding the special purpose school bus system), there was a decline in the share of travel captured by transit in almost all of the nine counties. Since the total patronage of the region's transit systems over this same period has de-

Table III-21

PERCENTAGE OF TRIPS BY PURPOSE, 1965

	<u>Average Weekday</u>	<u>Average Weekend Day</u>
1. Homebased Work	22.2	7.5
2. Homebased School	12.2	0.5
3. Homebased Personal Business, Medical, Dental	10.6	17.0
4. Homebased Social	6.7	13.2
5. Homebased Commercial Recreation	4.5	8.7
6. Homebased Shopping-Convenience	10.3	15.4
7. Homebased Shopping-Comparison	3.5	5.2
8. Homebased Other	9.3	12.6
9. Non-Homebased	<u>20.7</u>	<u>19.9</u>
	100.0	100.0

Source: BATSC Home Interview Data, 1965

Table III-22

MODAL SPLIT BY TRIP PURPOSE, 1965

	<u>%AUTO</u>	<u>%TRANSIT</u>	<u>%WALK</u>
1. Homebased Work	82	13	5
2. Homebased School	28	22	50
3. Homebased Personal Business, etc.	82	6	12
4. Homebased Social	82	3	15
5. Homebased Commercial Recreation	85	5	10
6. Homebased Shopping-Convenience	79	2	19
7. Homebased Shopping-Comparison	84	9	7
8. Homebased Other	90	1	9
9. Non-Homebased	<u>80</u>	<u>4</u>	<u>16</u>
All Purposes	76	8	16

Source: BATSC Home Interview Data, 1965

Table III-23

MODE OF TRAVEL TO WORK IN 1960

COUNTY OF RESIDENCE	% OF WORKERS BY MODE OF TRAVEL				
	AUTO	TRANSIT	WALK	OTHER	TOTAL*
		(bus, street-car, subway/ elevated railroad)		(other, work at home)	employed residence
ALAMEDA	74.9	10.6	7.9	6.6	100.0
CONTRA COSTA	85.6	4.4	5.0	5.0	100.0
MARIN	73.4	9.3	6.8	10.5	100.0
NAPA	81.1	1.2	9.4	8.3	100.0
SAN FRANCISCO	42.2	39.5	11.6	6.7	100.0
SAN MATEO	78.2	12.0	4.8	5.0	100.0
SANTA CLARA	82.2	5.2	5.4	7.2	100.0
SOLANO	78.5	2.3	9.9	9.3	100.0
SONOMA	76.3	1.4	8.5	13.8	100.0
TOTAL	69.9	15.4	7.8	6.9	100.0

* The non-response category is included here and is allocated to the reported modes according to their proportions to the total.

Source: U.S. Census, 1960

Table III-24

MODE OF TRAVEL TO WORK IN 1970

COUNTY OF RESIDENCE	% OF WORKERS BY MODE OF TRAVEL						TOTAL
	AUTO			TRANSIT	WALK	OTHER	
	DRIVER	PASSENGER	TOTAL	BUS, STREETCAR, SUBWAY, RAILROAD		TAXI, OTHER, AT HOME	
ALAMEDA	69.1	9.2	78.3	10.4	6.0	5.3	100
CONTRA COSTA	76.9	9.5	86.4	5.4	3.4	4.8	100
MARIN	70.2	10.7	80.9	8.1	3.9	7.1	100
NAPA	73.5	11.4	84.9	1.7	7.8	5.6	100
SAN FRANCISCO	41.5	7.5	49.0	35.3	11.1	4.6	100
SAN MATEO	74.8	9.6	84.4	7.5	3.5	4.6	100
SANTA CLARA	81.2	7.5	88.7	2.2	3.7	5.4	100
SOLANO	73.3	11.6	84.9	2.3	7.4	5.4	100
SONOMA	<u>78.2</u>	<u>6.7</u>	<u>84.9</u>	<u>1.7</u>	<u>5.5</u>	<u>7.9</u>	<u>100</u>
TOTAL	69.2	8.7	77.9	11.2	5.7	5.2	100

Source: U.S. Census, 1970

clined, this change in modal split to favor auto travel is an absolute change as well as a relative one.

The 1965 travel picture derived from BATSC data also shows that the majority of travel took place within counties rather than from county to county. Work trips were the most oriented to inter-county travel, in some cases representing quite a large proportion of the total in reflection of the "bedroom" nature of some areas, as shown in the Table below.

Table III - 25

Percentage of Person Trips Made Between Counties, 1965

	WORK TRIPS	ALL TRIPS
Alameda	16%	8
Contra Costa	38	15
Marin	46	17
Napa	28	13
San Francisco	11	8
San Mateo	41	21
Santa Clara	9	5
Solano	15	7
Sonoma	11	5

Source: BATSC Survey Data, 1965

Several significant trends are discernible from the 1960 and 1970 census data regarding inter-county commuting. For example, inter-county commutation is increasing. All counties but San Mateo over this period saw a greater share of their percentage of their own job pool held by non-county residents

increase. In consequence, it can be inferred that the distance between the job and the jobholder's residence has been increasing, a direct function of the willingness and the increased ability to travel.

Projections of future travel are as difficult and problematical as are projections of future population. It is difficult to foresee, however, that the average travel demand per person will decline, barring unanticipated events, and thus we can expect travel to increase at least as fast as does population. In fact, insofar as the trend of greater separation of residence from place of work continues, total travel can be definitely expected to mount at a higher rate than population.

Up to this point in time public transit has barely been able to hold its level of use constant, despite the historical increase of travel, even for the journey to work. Transit of course is able to perform most effectively for the journey to work, being competitive in terms of travel time because of the great automobile congestion at the peak hours and because work destinations are relatively centralized in comparison to shopping, recreational, and social destinations. Despite the fact that non-work travel has been growing faster than work travel, transit still finds it most effective to compete for riders to work at peak hours. Although there has been talk of arranging working hours to lessen the peaking phenomenon, the hours of 7 to 9 a.m. and 4 to 6 p.m. still exhibit very strong peaks. The transit

peak is even greater than the automobile peak, both in terms of passengers carried and transit vehicles on the road. During the remainder of the day transportation facilities are relatively lightly used. Transit operators can somewhat reduce the number of vehicles in use during periods of lesser demand and save on some costs. Nevertheless much transit equipment sits idle during the day and night, and could only be reasonably used at non-peak hours if congestion or restricted auto use increased off-peak transit travel demand.

Travel on the weekends does not generally exhibit a strong hourly concentration except in certain locations and under certain circumstances. The Golden Gate Bridge, for example, experiences a heavy flow of returnees from the recreation areas of Marin and Sonoma on weekend late afternoons and there are often massive jams of automobiles on Interstate Highways 80 and 580 returning from recreation sites in the Sierra Nevada on Sunday evenings. Although diversion of recreational travel to transit is possible, it will require major and unique efforts such as limiting auto access to recreational destinations.

The trend of less reliance on public transit and more use of the private auto has been made possible not only by the provision by government of better highways, but also by more private investment in automobiles. Table III-26 shows that the average car ownership per household has increased

TABLE III-26

AVERAGE CAR OWNERSHIP 1960 - 1970

	<u>Autos/Household 1960</u>	<u>Autos/Household 1970</u>
Alameda	1.11	1.26
Contra Costa	1.33	1.52
Marin	1.29	1.50
Napa	1.25	1.45
San Francisco	.71	.78
San Mateo	1.32	1.48
Santa Clara	1.33	1.56
Solano	1.18	1.39
Sonoma	<u>1.20</u>	<u>1.39</u>
Region	1.11	1.31

Source: U.S. Census, 1960, 1970

significantly in all of the Bay Area counties. Furthermore, Table III-27 shows that the percentage of no-car and one-car households has significantly declined from 1960 to 1970, while the percentage of households with two, three, and more cars has dramatically increased. This is not to say that car ownership or availability is universal. Indeed, there are still substantial numbers of persons who have no access to a private auto, and substantial numbers who have only partial access to one. These groups of the population are shown in Table III-28 and III-29. The first table indicates those persons with no access, or with very limited access to automobiles and who must therefore rely in large part on the public transit system for all kinds of travel. Specifically, these groups are the disabled and handicapped, the elderly, those below the poverty level, and those too young to drive. As there is significant overlap between the groups just mentioned and the zero-auto households, the latter have been shown separately. These Tables indicate that in every county over a quarter of the population experiences restricted mobility if the private automobile system is the only means of travel. This is true despite the high degree of auto ownership because there still exists a large number of households without cars, and in those households with single or multiple automobiles, there are many persons who cannot legally or physically operate them. The distribution of

Table III-27

PERCENTAGE OF HOUSEHOLDS WITH NO AUTO, ONE AUTO, ETC., 1960-1970

	NO CAR		ONE CAR		TWO CARS		3 OR MORE CARS	
	60	70	60	70	60	70	60	70
Alameda	18.5	16.7	55.1	46.7	23.1	30.5	3.1	6.0
Contra Costa	8.7	7.5	54.1	41.6	32.9	41.4	4.1	9.2
Marin	8.9	6.8	56.2	44.0	31.8	41.2	2.8	7.7
Napa	9.6	10.1	58.4	43.5	28.9	37.1	2.9	9.1
San Francisco	42.0	39.5	46.8	45.2	9.3	13.0	1.7	2.1
San Mateo	7.9	7.4	55.7	45.1	32.4	38.8	3.8	8.4
Santa Clara	8.7	6.8	53.9	40.1	32.4	43.3	4.8	9.6
Solano	11.0	8.8	63.1	50.0	22.8	34.4	3.0	6.7
Sonoma	14.4	10.5	54.5	47.4	27.0	34.0	3.9	7.9
Region	19.7	15.8	53.1	44.3	23.7	32.9	3.2	6.9

Source: U.S. Census: 1960, 1970

Table III-28

CAPTIVE TRANSIT RIDERS, 1970

COUNTY	<u>DISABLED</u>	<u>NON-POOR ELDERLY</u>	<u>BELOW LEVEL POVERTY</u>	<u>AGE 10- 15</u>	<u>TOTAL FOR COUNTY</u>	<u>% OF CO. POP.</u>	<u>% OF REGION'S CAPTIVE</u>
Alameda	64,763	76,948	118,935	117,704	378,350	34.8	24.4
Contra Costa	32,290	31,518	41,821	73,949	179,578	32.0	11.6
Marin	9,654	13,164	13,090	24,101	60,009	29.2	3.9
Napa	4,654	6,542	7,220	9,101	27,517	34.8	1.8
San Francisco	49,697	78,265	97,212	55,760	280,934	39.2	18.2
San Mateo	28,349	35,524	31,125	64,185	159,183	28.7	10.3
Santa Clara	55,814	50,040	79,170	135,435	320,459	30.0	20.8
Solano	10,105	9,098	18,353	20,835	58,391	34.2	3.8
Sonoma	12,142	19,036	26,568	24,275	82,021	40.0	5.3
TOTAL	267,468	320,135	433,494	525,345	1,546,442	-	100.0

Source: U.S. Census, 1970

Table III-29

ZERO AUTO HOUSEHOLDS, 1970

COUNTY	<u>PERSONS IN HOUSEHOLDS WITHOUT AUTOS</u>	<u>% OF COUNTY POP.</u>	<u>% OF REGION'S ZERO-AUTO POP.</u>
Alameda	158,704	14.7	30.1
Contra Costa	40,273	7.2	6.5
Marin	13,144	6.4	2.1
Napa	7,577	9.6	1.2
San Francisco	259,058	36.2	41.8
San Mateo	39,533	7.1	6.4
Santa Clara	66,839	6.3	10.8
Solano	12,744	7.5	2.1
Sonoma	21,039	10.3	3.4
TOTAL	618,911	-	100.0

Source: U.S. Census, 1970

individuals with limited mobility according to Table III-28 is fairly constant throughout the region as the concentration of low-income groups in the older areas is somewhat offset by the numbers of young persons in the suburbs. Households without autos are related to two factors, household income and the availability of the public transit alternative. The former factor shows a distribution oriented toward the region's older cities and the latter factor strongly emphasizes this distribution.

The extent to which the residents of the various Bay Area counties use transit is shown in Table III-30. This data, derived from transit operators' records and preliminary allocations of riders to counties of residence shows the expected result that San Franciscans rely heavily on public transit. Again, this result can be attributed to the highly developed public transit system in San Francisco, demographic characteristics, and the high degree of auto congestion prevailing in the City at many times of day.

That the future amount of travel and its modal shares is difficult to predict is amply demonstrated by three more or less recent situations which may greatly modify the travel behavior of the region's residents. First is the current gasoline situation. For several years planners have predicted that the price of gasoline would steadily rise, partially because of scarcity in the private sector and partially

Table III-30

ANNUAL TRANSIT USAGE PER PERSON, 1973

COUNTY	1970 POP. (000)	POP SERVED BY TRANSIT (000)	% POP. SERVED	TRANSIT OPERATORS	1973 PASSENG. FRM. COUNTY (000)	# OF TRANSIT TRIPS/PERSON SERVED/YEAR
Alameda	1073	976	91	AC, BART	55,670	57.0
Contra Costa	558	318	57	AC, BART	11,995	37.7
Marin	206	134	65	GGBHTD	9,028	73.0
Napa	79	40	50	NAPA CTY.	65	1.6
San Francisco	716	716	100	BART, GGBHTD, MUNI, AC	108,279	150.1
San Mateo ¹	556	268	48	Municipalities	1,061	4.1
San Mateo ²	556	468	84	SP, Greyhound	8,441	18.0
Santa Clara	1056	464	40	SCCTD, SP	2,060	4.4
Solano	170	75	41	Vallejo Cty.	407	5.4
Sonoma	205	75	35	GGBHTD, Santa Rosa	1,125	15.0
Regional Total ¹	4628	3066	66		189,690	61.87
Regional Total ²	4628	3266	70		197,070	60.34

See following page for Notes.

Notes - Table III-30

1. Only Public Operators in San Mateo County.
2. Public and Private Operators in San Mateo County (includes Southern Pacific and Greyhound).

Source: Patronage Data from Transit Operators, 1973

U.S. Census, 1970 and MTC/ABAG Extrapolations of
Population

BATSC Survey Data (Origin-Destination), 1965

because of increasing taxation. Taxation has crept up steadily, but probably not significantly, most lately with the extension of the sales tax to gasoline in 1972. But few expected the rise of price on the order of 11¢ or more per gallon attributable to private market action in the past several months. Even more significantly, few foresaw that gasoline would not only be expensive, but also difficult, sometimes impossible, to obtain. At the present time there is almost no data available on the impact of the current gasoline situation, nor does anyone have a clear picture on the extent to which the shortages will persist. However, at the peak of the fuel shortage substantial drops in traffic were observed on the Golden Gate Bridge during the weekend when recreational trips form a large part of the traffic flow. This is only natural since it is on Saturday evening and Sunday when gasoline has so far been most difficult to obtain. But it is no doubt true that people are attempting to economize on gasoline use by limiting auto travel for non-essential purposes as perhaps is reflected by the crowded buses of the Golden Gate and other transit systems.

A second factor which may fundamentally alter travel behavior in the region is stricter adherence to the air pollution standards promulgated by the Federal and State governments. Since automobiles contribute such a high percentage of total air pollutants in this region, two things can be done to reduce

emissions: (1) technologically limit emissions via control devices, or (2) limit automobile usage. So far most automobile manufacturers have been unable to develop control devices capable of fully meeting the long-term requirements. If and when they do, this will increase the cost of purchase and operation of a motor vehicle and affect driving habits as a result. In the meantime, manufacturers have been given extensions of the deadline in which to control emissions and attention has somewhat shifted to the possibility of cutting back on auto travel. Since the average auto carries only around 1 1/3 passengers per trip out of a capacity of four to six persons,* it is certain that air pollution benefits and other savings could be derived from more economical use of autos (albeit at some expense to traveller convenience). This explains the interest of the Environmental Protection Administration in car pools, bus lanes, improved mass transit systems, and higher parking fees. As yet this interest remains to be translated into enforceable directives or major changes in funding programs requisite to carry out such proposals, but the regulations of the Clean Air Act may before much longer begin to affect travel behavior.

*Average auto occupancy on the San Francisco-Oakland Bay Bridge at 5-6 p.m. is 1.45, daily average is 1.40. The Golden Gate Bridge reports 1.32 on average during weekday, 1.97 on Saturday, and 2.16 on Sunday. See Tables III-33 and III-34 in Part D of this chapter.

Finally, the travel behavior of the region's residents may be significantly altered by the effect of the largest new investment in Bay Area mass transit in the past thirty years--the BART rail rapid transit system. At this point in time the system is not fully operational, lacking service through the Trans-Bay tube. This operation, critical to the achievement of BART's primary impact, is presently scheduled to commence late in 1974, a delay attributable to the trouble-plagued train control mechanism and a high rate of rolling stock failure. The Federal Government is carefully monitoring BART's impact on travel patterns and other aspects of urban life by means of the Bart Impact Program conducted through MTC.

While the effect of these three factors cannot be quantitatively estimated at this time, there is little doubt that they will increase the attractiveness of public transit (as well as non-motorized travel modes) in comparison to travel by private automobile and auto travel may be made more efficient in the process. Still, these changes will not happen automatically, and if transit is expected to carry more of the travel load, it too will have to be made more attractive, efficient and capable of handling greater demands.

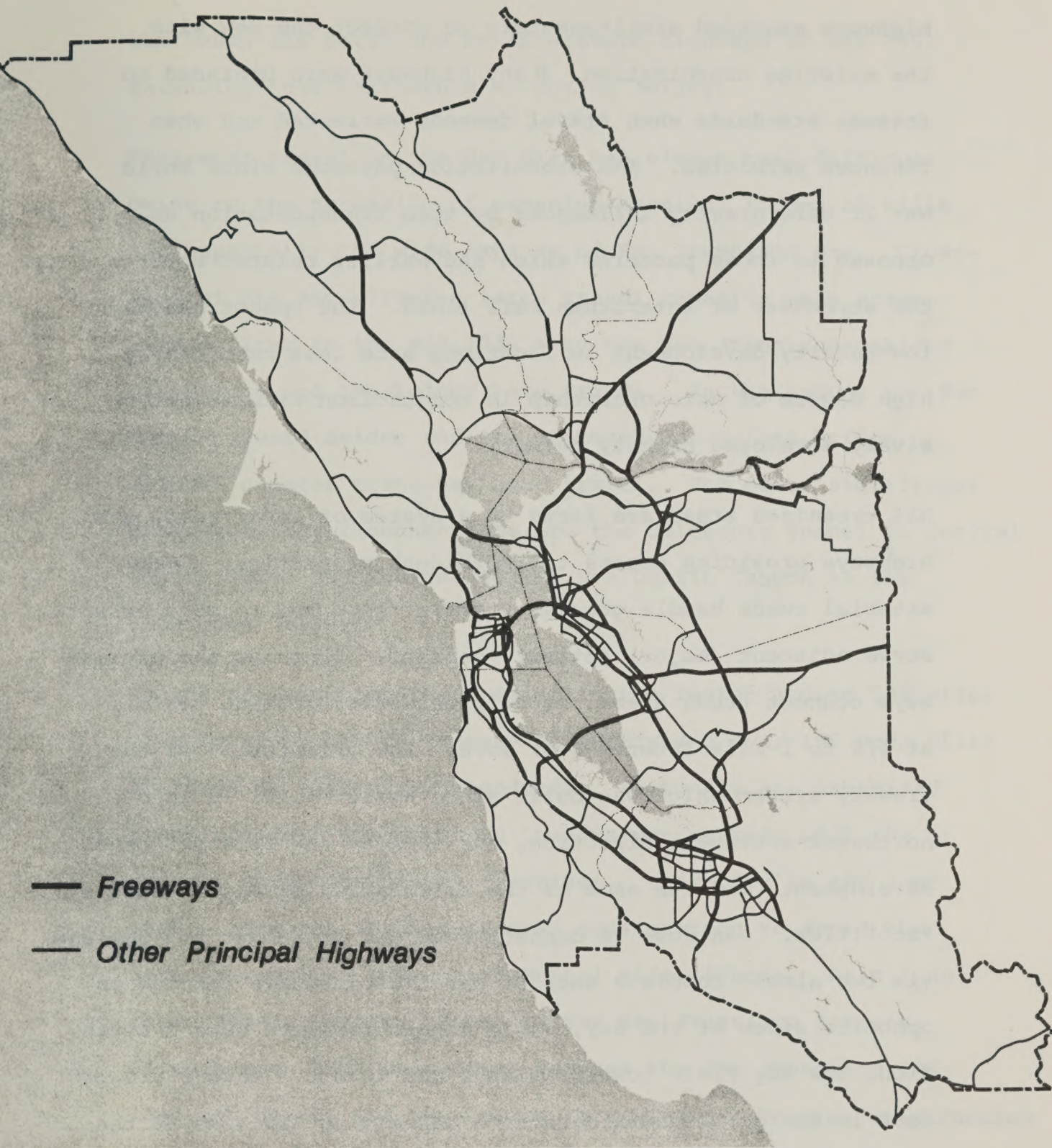
In the past decade transit planning has accepted the theory that in order to attract significant patronage away from the auto, a transit system would have to offer a comparably convenient travel service. During this period auto travel

was extremely convenient and to be competitive it was thought necessary to develop a very fast grade-separated transit system such as BART. Furthermore, reliance was placed on this type of solution by the apparent need to operate a transit system which was self-supporting financially at least on the operating cost side. Many of the recent transportation developments mentioned above have made auto travel less convenient. As a result, transit systems less attractive than BART have obtained a more competitive position for performing local, feeder, and trunkline transit functions. Recent experience has demonstrated the need for better local transit service to feed major trunkline, a need which earlier was assumed could be handled by the auto.

PART D

Description of the Regional Highway System. Urban development in the 9 Bay Area Counties has primarily occurred on the topographically flat margins of San Francisco Bay. Urban growth originally focused on the urban nuclei of San Francisco, Oakland and San Jose and by the 1960's had linked these three cities in a virtually solid band of housing, commerce, and industry. Aside from the bay-plain development, major suburban development has additionally occurred in Central Contra Costa County and in the Livermore-Amador Valleys of Alameda County.

As development proceeded in the Bay Area, the network of



EXISTING HIGHWAY FACILITIES

In The San Francisco Bay Region

highways expanded simultaneously to connect the new with the existing urbanization. Many highways were upgraded to freeway standards when travel demands warranted and when finances permitted. The urbanization patterns since World War II were greatly influenced by auto transportation as opposed to those patterns which had earlier related more to the streetcar or interurban rail lines. The upshot has been low-density development in locations made less remote by a high degree of auto ownership in conjunction with an extensively developed highway network.

All urbanized areas are laced by a system of local roads and highways providing access to individual properties. Larger arterial roads handle greater traffic flows and to some extent serve adjacent (major) activity centers. Freeways and expressways connect urban areas, usually only distributing traffic at 1/2 to 1-mile intervals or more. The orientation of the freeway system which was built since World War II is in a northwest-southeast direction, the same as the orientation of development, and the same as the orientation of major transit facilities. San Jose is connected to San Francisco and Oakland via two almost complete sets of parallel freeways running on opposite sides of the Bay, while single freeways extend north along the Bay Plain toward Vallejo and Novato. Interstate 680 runs in the north-south direction connecting San Jose to the Livermore Valley and Concord Area. Connection to the rest of the state is accomplished primarily via U.S. 101 exiting to

the South and North and by Interstate Highways 80 and 580 extending into California's Central Valley.

East-west travel in the Bay Area has always been difficult owing to the necessity of crossing parallel ridges of hills and especially the wide expanse of San Francisco Bay. Crossings of the Bay allowing large travel capacity were accomplished first in the mid-1930's by the San Francisco-Oakland Bay Bridge and the Golden Gate Bridge. In the 1950's the San Mateo-Hayward Bridge and the Richmond-San Rafael Bridge allowed greater trans-bay auto travel. The other significant east/west travel connections are the Caldecott Tunnel to Central Contra Costa and Interstate 580 via Dublin Canyon to the Livermore Valley.

At the present time there exist in the region around 500 miles of roadways built to freeway standards and over 150 more miles of roads at expressway standards. Virtually all urbanized areas are well-connected to the freeway system, with the unusual exception of San Francisco. This city in the late 1950's rejected further freeway construction to avoid the attendant social and environmental side-effects. As a result there remain certain "gaps" in the San Francisco freeway network such as a connection between the San Francisco-Oakland Bay Bridge and the Golden Gate Bridge. Freeway construction has also slowed somewhat over the past few years, as a consequence of more opposition to freeways, rising construction

costs and declining road budgets.

Freeways and surface streets serve a wide variety of vehicle types and trip purposes, among them mass transit, especially for the journey to work. The major freeways and arterial streets which are utilized by transit vehicles are shown in Table III-31. Buses generally travel in a non-stop express mode on freeways, although the "bus pads" on U.S. 101 in Marin County are an exception. Transit use of arterial streets is common for local service while heavy use of local residential streets is avoided if possible. Transit use of streets is also governed by limitations placed by grades and curves on a transit vehicle's maneuverability. Total travel on freeways typically exhibits a double peak during weekdays corresponding to and resulting from the similar opening/closing hours of most places of employment. It is during these peak travel hours that the greatest vehicular congestion takes place. The most severe congestion locations are given for highway facilities which accommodate major transit usage in Table III-31.

Ordinarily there have been few restrictions on the use of freeways, arterials, and other roadways other than adherence to the traditional traffic control regulations such as stop signs, speed limits, etc. However, certain adaptations have been made recently to give preference to the passage of transit vehicles in recognition of their greater person-carrying capacity and the waste of the typical one-person-per-car habit.

Table III-31

ROADWAY FACILITIES WITH SIGNIFICANT TRANSIT USAGE

<u>GROUP I: FREEWAYS</u>	<u>MAJOR TRANSIT OPERATORS</u>	<u>MAJOR PEAK HOUR POINTS OF CONGESTION</u>
1. U.S. 101 Golden Gate Bridge to Santa Rosa	GGBHTD*	Doyle Drive, GG Bridge, Waldo Grade to Central San Rafael, Rte. 37 to Novato.
2. Calif. Rte. 17 (Nimitz Fwy)	A/C TRANSIT	San Francisco-Oakland Bay Bridge to San Leandro
3. I-80 (San Francisco to Alameda/Contra Costa County Line)	A/C TRANSIT	S.F. - Oak. Bay Bridge(SFOBB) and Eastshore Fwy.
4. I-580	A/C TRANSIT	Rte. 24 Interchange to SFOBB
5. Calif. Rte. 24	A/C TRANSIT, Greyhound	Caldecott Tunnell to I-580
6. U.S. 101 San Francisco	S.F. MUNI	Entire County
7. I-280 San Francisco	S.F. MUNI	Entire County
<u>GROUP II: MAJOR ARTERIALS</u>		
8. Geary St., San Francisco	S.F. MUNI	Market St. to Van Ness.
9. Mission St., San Francisco	S.F. MUNI	Steuart to Army.
10. Market St., San Francisco	S.F. MUNI	Steuart to Castro.
11. Lombard St., San Francisco	GGBHTD	Van Ness to Doyle Dr.
12. California St., S.F.	S.F. MUNI	Market to Arguello
13. Sansome-Battery Sts., S.F.	S.F. MUNI, GGBHTD	Entire
14. Telegraph Ave., Oakland-Berkeley	A/C TRANSIT	Broadway to Bancroft
15. MacArthur Blvd. Oakland-Hayward	A/C TRANSIT	San Pablo to Seminary
16. Broadway-College, Oakland-Berkeley	A/C TRANSIT	Rte. 17 to Bancroft
17. Shattuck Ave., Oakland-Berkeley	A/C TRANSIT	Telegraph to University
18. San Pablo Ave. Oakland→Richmond	A/C TRANSIT	Broadway to University
19. E. 14th St., Oakland-San Leandro	A/C TRANSIT	Lakeshore to 77th
20. University Ave. Berkeley	A/C TRANSIT	7th to Oxford
21. Broadway - San Francisco	S.F. MUNI	Sansome to Van Ness
22. Columbus - San Francisco	S.F. MUNI	Montgomery to Bay
23. Fillmore St., San Francisco	S.F. MUNI	California to Oak

* Golden Gate Bridge, Highway and Transportation District

Source: Transit Operator Data; Traffic Counts from CALTRANS; BART Impact Study (MTC) BATSC, etc.

Table III-32 shows what kind of adaptations have been made to date and where they are located in the region. Much effort and study is currently being devoted to expanding the preferential use of streets by transit vehicles during the peak hour particularly in San Francisco. Transit use of freeways and surface streets can be extremely significant at peak hours in terms of passenger-carrying ability as is strikingly demonstrated by Tables III-33, III-34, and III-35 which contain statistics on two trans-bay bridges and three surface arterial streets. On the San Francisco-Oakland Bay Bridge for example during the peak morning hour, buses move over half of the commute load in only around 4% of the vehicles, a phenomenon which is repeated in the opposite direction every weekday evening. The Golden Gate Bridge experiences this phenomenon as well, with almost as great a proportion of commutation accommodated via transit. On surface streets the percentage of travelers carried by transit is lower but still very significant in light of the small percentage of vehicles represented by buses. San Francisco shows this most clearly, having the most compact development and heaviest amount of transit service, such as on Market, Geary and Mission Streets. The justification for transit preference on surface streets is strongest at peak hours when the transit vehicle and its load of passengers would ordinarily be held back by large volumes of low-occupancy private autos. Accordingly, transit preferential use

Table III-32

SPECIAL TRANSIT USE OF HIGHWAY FACILITIES

A. Separate Bus Lane

1. San Francisco-Oakland Bay Bridge: Approach to Toll Plaza (shared with car pools), peak AM period only for transit vehicles.

B. Reversed Bus Lane

1. Golden Gate Bridge to Richardson Bay Bridge on U.S. 101: Buses only during AM and PM peak periods.

C. Shared Rights-of-Way - no mixed traffic

1. BART on RT. 24 from Orinda to Walnut Creek.
2. BART on I-280 in San Francisco.

D. Special Adaptations

1. Bus pads off U.S. 101 interchanges in Marin County: various locations.
2. Transit-only interchange to Trans-Bay Terminal off I-80 for A-C Transit and Greyhound.

E. Freeway Operations - mixed traffic

1. Golden Gate buses on U.S. 101 in Marin and Sonoma Counties north to Santa Rosa.
2. Golden Gate buses on Doyle Drive, San Francisco.
3. A-C Transit buses on Rte. 17 (Nimitz Fwy) north to Richmond and south to Hayward.
4. A-C Transit buses on I-580 from Bay Bridge to Castro Valley.
5. A-C Transit buses on Rte. 24 from vicinity Bay Bridge to Claremont exit.
6. A-C Transit express buses on Rte. 13 (Warren Fwy).
7. S.F. MUNI buses on U.S. 101 and I-280 in San Francisco.

F. Transit Use of Surface Streets and Arterials

Numerous

Table III-33

TRANSIT USE OF SAN FRANCISCO - OAKLAND BAY BRIDGE

WESTBOUND			EASTBOUND		
<u>AUTOS</u>	<u>#</u>	<u>% of TOTAL</u>	<u>AUTOS</u>	<u>#</u>	<u>% of TOTAL</u>
6:30 AM-6:30 PM	69,750	100.0	6:30 AM-6:30 PM	70,200	100.0
7:00 AM-8:00 AM	9,056	12.9	4:00 PM-5:00 PM	8,660	12.3
8:00 AM-9:00 AM	8,094	11.6	5:00 PM-6:00 PM	8,260	11.7
<u>AUTO PSGRS.</u>	<u>#</u>	<u>% of TOTAL</u>	<u>AUTO PSGRS.</u>	<u>#</u>	<u>% of TOTAL</u>
6:30 AM-6:30 PM	99,742	100.0	6:30 AM-6:30 PM	95,472	100.0
7:00 AM-8:00 AM	14,127	14.1	4:00 PM-5:00 PM	12,037	12.6
8:00 AM-9:00 AM	10,603	10.6	5:00 PM-6:00 PM	11,977	12.5
<u>BUSES</u>	<u>#</u>	<u>% of TOTAL</u>	<u>BUSES</u>	<u>#</u>	<u>% of TOTAL</u>
6:30 AM-6:30 PM	1,266	100.0	6:30 AM-6:30 PM	1,252	100.0
7:00 AM-8:00 AM	376	29.7	4:00 PM-5:00 PM	153	12.2
8:00 AM-9:00 AM	163	12.9	5:00 PM-6:00 PM	342	27.3
<u>BUS PSGRS.</u>	<u>#</u>	<u>% of TOTAL</u>	<u>BUS PSGRS.</u>	<u>#</u>	<u>% of TOTAL</u>
6:30 AM-6:30 PM	30,616	100.0	6:30 AM-6:30 PM	30,429	100.0
7:00 AM-8:00 AM	14,759	48.2	4:00 PM-5:00 PM	6,063	19.9
8:00 AM-9:00 AM	5,594	18.3	5:00 PM-6:00 PM	13,694	45.0
<u>% of VEHICLES WHICH ARE TRANSIT</u>			<u>% of VEHICLES WHICH ARE TRANSIT</u>		
6:30 AM-6:30 PM		1.7	6:30 AM-6:30 PM		1.7
7:00 AM-8:00 AM		3.9	4:00 PM-5:00 PM		1.7
8:00 AM-9:00 AM		1.9	5:00 PM-6:00 PM		3.9
<u>% of PASSENGERS ON TRANSIT</u>			<u>% of PASSENGERS ON TRANSIT</u>		
6:30 AM-6:30 PM		23.4	6:30 AM-6:30 PM		24.1
7:00 AM-8:00 AM		51.0	4:00 PM-5:00 PM		33.4
8:00 AM-9:00 AM		34.5	5:00 PM-6:00 PM		53.3
<u>AVERAGE VEHICLE OCCUPANCY</u>			<u>AVERAGE VEHICLE OCCUPANCY</u>		
	<u>AUTO</u>	<u>BUS</u>		<u>AUTO</u>	<u>BUS</u>
6:30 AM-6:30 PM	1.43	24.2	6:30 AM-6:30 PM	1.36	24.3
7:00 AM-8:00 AM	1.56	39.2	4:00 PM-5:00 PM	1.39	39.6
8:00 AM-9:00 AM	1.31	34.3	5:00 PM-6:00 PM	1.45	40.0

Source: ITTE Counts (Covers 1973 typical weekday from 6:30 AM to 6:30 PM; night transit counts not available for comparison to auto).

Table III-34

TRANSIT USE OF GOLDEN GATE BRIDGE -
SOUTHBOUND WEEKDAY¹

<u>AUTOS</u>	<u>#</u>	<u>% OF TOTAL</u>
24 hours	44,642	100.0
7-8 AM	5,937	13.3
8-9 AM	5,714	12.8

<u>AUTO PSGRS.</u>	<u>#</u>	<u>% of TOTAL</u>
24 hours	62,532	100.0
7-8 AM	7,836	13.3
8-9 AM	7,542	12.8

<u>BUSES</u>	<u>#</u>	<u>% OF TOTAL</u>
24 hours	352	100.0
7-8 AM	119	33.0
8-9 AM	51	14.0

<u>BUS PSGRS.</u>	<u>#</u>	<u>% OF TOTAL</u>
24 hours	8,685	100.0
7-8 AM	4,998	57.5
8-9 AM	2,142	24.6

% OF VEHICLES WHICH ARE TRANSIT

24 hours	0.7
7-8 AM	1.9
8-9 AM	0.8

% OF PASSENGERS ON TRANSIT

24 hours	12.1
7-8 AM	45.7
8-9 AM	22.1

AVERAGE VEHICLE OCCUPANCY

	<u>AUTO²</u>	<u>BUS</u>
24 hours	1.32	24.7
7-8 AM	1.32	42.0
8-9 AM	1.32	42.0

Source:

1. Statistics from GGBHTD for 9-25-73 and District Bus Schedule.
2. Aver. Vehicle Counts available for period 6-10 only.

Table III-35

TRANSIT USE OF SURFACE STREETS

A. Broadway at 51st, Oakland: Weekday Traffic Away from Oakland CBD¹

	Vehicles	Non Xit Cars (%)	Xit Vehicles (%)	Car Psgrs. (%)	Transit Psgrs. (%)
24 hours	14,603	99	01	85	15
4-5 PM	1,429	99	01	82	18
5-6 PM	1,762	99	01	85	15

B. Telegraph Ave. South of 45th St. away from Oakland CBD²

	Vehicles	Non Xit Cars (%)	Xit Vehicles (%)	Car Psgrs. (%)	Transit Psgrs. (%)
24 hours	11,838	99	01	84	10
4-5 PM	1,086	99	01	78	16
5-6 PM	1,045	99	01	90	22

C. Geary Ave. at Presidio, San Francisco³

	Vehicles	Non Xit Cars (%)	Xit Vehicles (%)	Car Psgrs. (%)	Transit Psgrs. (%)
24 hours	30,000	99	01	64	36
5-6 PM	1,400	97	03	51	49

1. Wednesday, 11-1-73 BART Impact Study Travel Counts

2. Friday, 10-06-72 BART Impact Study Travel Counts

3. Average over 1968-1972 from CALDOT Traffic Counts, Operator Data (MUNI)

schemes have emphasized flexibility, e.g. being able to change to the other side of the roadway as travel demand shifts. While the growth of transit systems which operate on exclusive rights-of-way has been significant and may expand, the bulk of transit passengers will continue to be carried on rights-of-way shared with non-transit vehicles. As transit passenger volumes grow, the priority afforded transit vehicles on these rights-of-way must be increased.

PART E

Transit Coordination. The San Francisco Bay region contains numerous transit operators, as do many metropolitan areas of this size and population. In many cases this type of fragmented operating situation leads to difficulties in coordinating service functionally and geographically. Typical coordination problems which are encountered include the following:

- a) Difficulty of establishing service across jurisdictional boundaries
- b) Difficulty of coordinating routes and schedules within areas served by more than one operator
- c) Multiple claims for fund sources when an area is served by more than one operator
- d) Inability to institute uniform systems of fares and transfers*

*Fare/transfer interrelationships between the major transit operators are shown geographically in Appendix Tables 5, 6 and 7.

While many benefits from improved coordination of transit operations directly benefit the public user, there are also substantial efficiencies which could accrue to the operators through the establishment of joint public information programs, sharing of technical expertise, avoidance of duplicate service, and so on.

Up to this point most effort to coordinate transit operations has been made in response to the opening of the BART system which passes through areas which have been served for many years by the established A-C Transit and Municipal Railway systems. The most significant impact of BART is undoubtedly on the Trans-Bay service of A-C Transit, as the latter will be to some extent supplanted when the BART tube beneath the bay is opened. Several studies, some funded by UMTA, have been made to examine coordination problems between BART, A-C, and MUNI.

In San Francisco a number of changes in transit operations have been or will shortly be made in response to the opening of BART. Several MUNI routes have been modified to feed into, or at least pass by, BART stations. A new transfer system is expected to begin operation shortly based on the model of the Southeastern Pennsylvania Transit Authority (SEPTA) by which two transfer tickets are sold in BART stations for 25¢, in order to complete a patron's journey on the MUNI system. Since the MUNI fare is 25¢, this system represents a loss of 25¢ per transfer which the two operators have

agreed to share on a provisional basis.

In the East Bay various A-C Transit routes have been modified to feed to BART stations. Additional plans to strengthen this feeder relationship are being prepared for implementation as soon as BART Trans-Bay service commences. A transfer system has been established whereby free transfers to A-C are available within BART stations for patrons traveling away from the station. Patrons traveling to BART must pay the normal A-C fare. Although the details differ from the BART-MUNI transfer system, the relative loss of fare is similar and the operators have agreed for the interim to split the cost equally. In addition plans are being readied for the addition of certain new A-C Transit routes expressly to serve BART stations and a Dial-a-Bus system in Richmond which will serve this purpose among others. Coordination of A-C Transit and BART operations is also being explored in the areas of adjusting bus departures from BART stations to coincide with train arrivals; publishing of combined bus/rail schedules; and improved headways on some routes which feed BART.

Other transit coordination programs and problems which are under study or have been acted upon include:

- a) Special small-vehicle feeder bus service from the University of California Berkeley campus to the central Berkeley BART station;

- b) Publication (in 1972) by a private group of the booklet, Ride On, giving information on all the region's transit operators. MTC intends to sponsor a similar but more comprehensive and updated booklet;
- c) Negotiations are underway between A-C Transit and Golden Gate Bridge, Highway and Transportation District to establish public transit service across the Richmond-San Rafael Bridge;
- d) MUNI has adjusted certain routes to better dovetail with Golden Gate Transit service, especially line 28 which now extends to the Bridge Toll Plaza;
- e) A-C Transit has done significant work on contract with the Santa Clara County Transit District, lending valuable expertise in the establishment of this new operating district;
- f) The ultimate integration of San Mateo County's many municipal transit operations into an eventual larger county-wide transit district has been pledged consistent with current county-wide transit studies and MTC's review of Transit Development Act Claims.

Although the progress noted above has produced significant benefits in the form of a more effective transit system, much remains to be done to truly achieve a regionally-coordinated transit service. Research done by MTC staff has identified the following areas of potential improvement of transit coordination:

- a) Develop an up-to-date inventory of transit assets, including equipment and other facilities.
- b) Develop a coordinated research and evaluation program to continuously identify new service needs, demonstration projects and monitor the impact of facility innovations and marketing variables.
- c) Develop coordinated transit information aids for the public, especially a region-wide booklet on routes/fares/schedules, a telephone book supplement with a full transit section, uniform transit timetables, maps, and bus stop markers, a centralized transit telephone information center, etc.
- d) Develop a coordinated transit advertising and promotion campaign.
- e) Achieve a fully coordinated fare and transfer system.

- f) Examine and modify transit routes and schedules to coordinate between operators, and between the operators and major traffic generators.
- g) Coordinate transit equipment, such as spare parts pools, joint use of capital equipment, etc.
- h) Examine role of public participation and regulation in the process of modifying and improving transit operations.
- i) Integrate para-transit service (taxis, jitneys, charter buses, car pools, etc.) into the greater public transit system.

It is intended that a greater degree of coordination of the region's transit operations will not only result in a better transit service for the populace but to some extent will also capture for the operators greater patronage and the economies of larger-scale programs. The MTC Regional Transportation Plan adopted in June of 1973 contained the outline of a Transit Federation (TF) which was intended to study and implement many of the coordination programs mentioned above. The TF is to be composed of representatives of the various public transit operators. At this time the TF, an advisory body to the MTC, is in the process of being formed. It is expected that among the highest-priority efforts of the TF will be the development of comprehensive transit public information and promotion programs.

PART F

Legislation Affecting Public Transit Operations. In the last several years the State and Federal governments have enacted legislation which bears significant implications for the region's transportation system. Major pieces of relevant legislation and a capsulized description of each is presented below.

The California Transit Development Act of 1971 (SB 325) extended the State sales tax to gasoline and earmarked 1/4¢ of all sales tax proceeds for public transit improvement in the county where the revenue was generated. The authority to allocate this amount in this region among eligible claimants in each county was given to MTC. This revenue source annually raises in excess of \$35 million. The funds must be spent at least 75% on capital improvements, but the 25% limit on operating expenditures may be waived for 5 years for new transit districts.

The Clean Air Act of 1972 placed stringent requirements on the allowable pollutant emissions of motor vehicles and also established stringent air quality standards for metropolitan regions. Originally all standards were to have been met by 1975 but the deadlines for compliance, particularly for motor vehicle emissions, have been extended at last action to 1977. Since most regions continue to violate ambient air standards, some emphasis has been shifted by

the Environmental Protection Agency (EPA) to reducing vehicle miles of travel as an interim measure. EPA has indicated possible imposition of parking surcharges, etc. to discourage profligate driving but so far has only strongly advocated the provision of exclusive bus lanes on major surface roads. The longer that air quality conditions deteriorate in the metropolitan areas of the U.S., the greater is the probability that EPA will begin to enforce tougher measures to curtail auto use.

The Federal Highway Act of 1973 is the latest Federal action to increase the amount of funds available for public transportation, not only by increasing the funds of the Urban Mass Transportation Administration grant programs but also for the first time enabling a diversion to transit use of funds previously earmarked for highway purposes. Specific features of this legislation include:

- Increasing UMTA's capital grant contracting authority from \$3.1 to \$6.1 billion at a Federal share of 80% rather than 66 2/3%.
- Increasing the Federal UMTA share of transit planning projects from 66 2/3% to a flexible percentage up to 100%.
- Allowing diversion of the urban system highway funds allocated to urban areas for

transit beginning in FY 1974. Transit expenditures can be for fixed rail facilities and rolling stock for any transit mode, the Federal share being 70% of such projects; the national urban system fund for FY 1974-75 is \$800 million.

- Interstate Highway funds may be used for transit projects if state and local governments reject a link of the system in favor of a comparable transit solution which could then be funded 80% federally.
- Certain restrictions of previous Highway Acts have been removed in order to facilitate the funding of exclusive transit lanes and other transit preferential devices or surface streets.

This legislation will not cause any drastic alterations in the region's transportation environment. The increase in available capital grants could be quickly consumed by possible upcoming transit acquisition construction proposals nearing the completion of planning. Further, the amount of diversion allowed from highway funds is still relatively small. The diversion, while setting a precedent, still does not adequately speak to the need for full transport

funding flexibility between modes. Moreover, the Act does not deal with the question of transit operating cost subsidies, certainly the most critical financial problem faced by the public transit industry today and in the foreseeable future.

PART G

Summary of Chapter III

--The existing public transit system in the Bay Area consists of a fleet of 2330 vehicles operating over 230 routes. Most transit service is offered during the peak travel hours on weekdays, and is oriented toward work destinations of the largest urban centers.

--Transit ridership has, until recently, steadily declined since the post-World War II era. Although population and travel demands have both increased rapidly over this period of time, the convenience and low out-of-pocket cost of automobile use has allowed this mode to absorb all increases in travel. The continuous decline of quality and quantity of transit services over this period has reinforced the dominance of the automobile in meeting urban travel needs.

--Much of the residential development in the region since World War II has been of a low-density suburban character which is more suited to being served by auto transport than by public transit. Recent trends indicate a reem-

phasis of higher-density development, particularly in areas which already contain some multi-family dwellings.

--Automobile ownership has increased dramatically over the past several years, especially in terms of multiple auto households. However, there remains a sizeable portion of the region's population which is fully or partially dependent on the transit system for mobility.

--The transit services offered by the various operators do not function as a comprehensive metropolitan system. Fare systems differ, transfer arrangements are not yet common, public information is spotty, and scheduling and routing are only beginning to show inter-agency coordination.

--The expansion of transit services outside of older urban areas has been limited. Several of the new public transit authorities have so far only been able to replace transit services formerly operated by private firms. Many areas of urban and suburban development have received little or no improved transit service. Disparities in transit service offered to various parts of the region can in part be attributed to gaps in transit district coverage and in part to an area's differing willingness to pay for transit service.

--The greater part of the region's public transit system functions on surface roadways in mixed traffic with cars

and trucks rather than on separate rights-of-way. When highway congestion builds up at peak hours transit must also slow down although it may be carrying travelers more efficiently than the private auto. Recent attention has been given to allowing transit vehicles preference over autos on heavily traveled roads during peak travel hours.

--Within the next few years it is conceivable that all urbanized parts of the region will be within a transit district capable of providing local transit service and in most cases long-distance trunk transit either unilaterally or by coordinative agreements with other districts.

--Transit systems have often been viewed as operations which should be self-supporting (subsidy free). As a result, they have had to raise fares and/or cut service back to remain within operating budgets. As either action causes patronage losses, another spiral of fare raises and service cuts has frequently been experienced.

--Transit systems are experiencing steadily rising operating deficits primarily because labor costs are rising more rapidly than fare revenues.

--Existing fare, tax and toll revenue sources will not keep pace with continued operation of the existing transit system. The region's transit system can over the next

ten years anticipate a cumulative total of over \$2 billion in operating costs, of which fare structures currently in effect will pay less than half, even assuming high patronage levels. Fare revenues together with all other existing sources of outside funding will fall \$460 million short of cumulative ten-year operating costs.

--The major capital investment in public transit has been in trunkline transit over the past decade, the majority on the BART system. Capital spending on local transit is increasing over the short run with major improvements underway or slated for San Francisco's MUNI, A-C Transit, and Santa Clara County Transit District. Total capital spending as presently programmed by the transit operators will drop off sharply after three years.

--The Federal, State, and Local governments are making increased efforts to develop transit funding sources commensurate with social, environmental, energy, and efficiency policies. However, as yet our funding sources are inadequate to build and operate a transit system capable of effecting or accommodating any significant changes in automobile-dominated travel patterns.

--The short-range capital improvements proposed for the region's transit systems can be funded for the most part from existing sources. Recent State and Federal funding programs have encouraged these investments. Over \$300

million dollars in capital expenditures are proposed for the next five years by the various transit operators, with related debt service obligations of \$650 million. As a result, we can expect tangible improvements in the quality of existing transit services in the near future. However, all capital improvements obligate added operations costs which cannot be fully funded from existing sources.

--The past year has witnessed a reverse in the downward trend of public transit usage. New systems are opening expanded services, but of more significance is a change in the population's willingness to use transit. Congestion on highways, high parking and toll costs, lowered freeway speeds, and scarce and expensive gasoline have all acted to make automobile usage less satisfactory. At the same time environmental concerns and rising costs have signalled the end of extensive highway building. As a result of these many factors and their long range implications, there is an especially acute need for planning and implementing an improved public transit system for the Bay Area.

Chapter IV

SHORT RANGE TRANSIT IMPROVEMENTS

There is an enormous variability in the amount of time required to implement a planned transit improvement.

Obviously major construction programs such as a BART extension in a developed area are among the most time-consuming to plan, engineer, and construct. Adding to implementation time are factors such as preparing environmental statements and Federal grant applications, securing adequate local financial revenues, or establishing/altering institutional arrangements. Even when conditions are ideal for a transit investment--that is, funds are available, political consensus is reached, a jurisdiction is capable of sponsorship, etc.--a wait of a year or more may be required for delivery of one of the most common pieces of transit equipment: the bus. There are certain transit improvement options available which can be instituted relatively soon, primarily because they do not involve large capital expenditures. Furthermore, there are certain improvements which are not usually thought of as being strictly within the purview of transit (or even transportation) agencies, but which can significantly augment transit service. The purpose of this chapter is to define a series of very short-range proposals which will improve transit operations in the Region.

A. Transit Preferential Streets and Freeway Lanes

This type of improvement is possibly the most promising of all short-range changes and can be considered a long-range program as the need for transit preference increases.

Basically the solution consists of speeding the passage of transit vehicles on roadway facilities by means of physical barriers and other restrictions which reduce conflicts with other vehicles. Typically as a result the speed of transit operations is increased while the speed of auto travel may be decreased, although this is not always true. When transit carries a majority of the travelers on a facility, as is now the case on certain roads at peak travel times, the benefits of this program are obvious. In addition, when any alteration is effected in the relative travel ease between the two modes, some intermodal shift of passengers will be experienced. Inasmuch as among the objectives established by MTC are ones to increase transit usage in certain congested areas, it will be desirable not only to increase transit convenience but also at times to make automobile use less convenient. The appeal of transit preferential street treatments is particularly great since it not only accomplishes the necessary changes in modal convenience but it also is flexible, being capable of implementation only along certain route sections or only during certain time periods. Finally, transit preferential street programs are relatively inexpensive and do not require long construction periods.

However, agreement on projects is not always easy to obtain, because the roadway facilities are seldom under the control of a single government agency let alone a transit one.

San Francisco has pioneered the transit preferential approach to surface streets in the Region. Presently being processed through committee hearings are proposals to change the physical characteristics of streets such as Polk, Sutter, Third, Kearny, Post, Fillmore, and Stockton. In addition, changes in administrative and enforcement practices are proposed in order to insure effective use of transit preferential facilities. Street improvement proposals specific to the transit preferential plans include: exclusive transit lanes, exclusive transit use of streets, counter-directional lanes on one-way streets, extended sidewalk bus stops, added commercial parking to reduce on-street double-parking, changes in bus stop location, changes in traffic signal timing, earlier start of tow-away operations and transit vehicle actuated traffic signals. Not all of these are proposed currently for San Francisco, but most have been implemented in other parts of the U.S.

Several other transit preferential improvements have been implemented on the Region's freeway system, namely on U.S. 101 (reverse bus lane in Marin Co.) and the San Francisco-Oakland Bay Bridge approach which has exclusive bus/carpool lanes. By 1976 the California Department of Transportation

expects to have 56 miles of freeway carpool and bus lanes operational.

At the present time the U.S. Environmental Protection Agency is calling for the establishment of 45 miles of exclusive busway on the Region's freeway network. In addition, there remain multiple opportunities for transit preferential treatment of surface streets in San Francisco, the East Bay and other cities. The suggested criterion for evaluating the need for transit preferential treatment is that the proposal should achieve a total time savings to the user group of the facility. That is, the savings of time to the transit users should in the aggregate exceed the loss of time to the automobile users. Since most preferential treatment programs are not capital-intensive, priorities among projects can reasonably be determined by the aggregate amount of time savings and ease of implementation. The Traffic Coordinating Council (TCC) formed by MTC is dealing with the setting of priorities for exclusive bus lanes on the Region's freeway network and is developing exemplary projects to demonstrate where, when and how transit preferential treatments can increase a road's person-carrying capacity. The TCC expects to institute a cooperative traffic surveillance program to evaluate the effectiveness of transit preferential projects. The TCC will also be advising MTC and the California Department of Transportation on freeway ramp metering proposals which are very closely related to

transit preferential programs. It is beyond the scope of this document to identify the streets and freeways which should be redesigned to facilitate transit usage. Instead, it is assumed that the Traffic Coordinating Council can do the following:

- Support transit preferential streets proposals from the planning to the implementation stage;
- Monitor existing and new transit preferential street programs to gauge effects on vehicle congestion and time savings to passengers;
- Encourage undertaking or coordination of transit preferential programs by local jurisdictions such as San Francisco, Oakland, Berkeley, or San Jose;
- Publish findings of traffic surveillance efforts;
- Compile a list and description of various transit preferential improvements for use by local governments.

B. Bus Shelter Program

The non-roadway portion of city street rights-of-way can also be modified in order to facilitate transit operating efficiency and to increase patron comfort. While elaborate facilities could be designed in effect to provide for miniature transit stations along high-volume routes, the major short-term emphasis of this proposal is to provide relatively inexpensive transit shelters and benches which will make

waiting for transit service far more tolerable than at present. In addition to preventing the patron's exposure to rain, wind, and cold, small transit shelters are also the ideal location for posting information on transit services. To some extent, the cost of transit shelters and benches may be underwritten by direct advertising and by participation of nearby merchants. Also, along with transit preferential streets, funds for this program are likely candidates for support through diversions from highway funds. The design of these facilities is a highly localized affair, depending on the type of transit service, right-of-way design characteristics, auto and pedestrian flow volumes, etc., and should thus be the primary responsibility of the various transit operators and city/county departments. At present, Muni, BART, and AC Transit have bus shelter programs underway.

C. Ramp Metering of Freeways

This program seeks to maintain a free flow of vehicles on freeways by limiting the entry of vehicles at on-ramps to the number which can be accommodated at a smooth high-capacity flow (usually around 35 mph). Public transit vehicles should have priority access to metered freeways by means of specially-designed ramps which allow buses to bypass auto queues. Ramp metering is somewhat analogous to an exclusive busway lane in that the result is free-flow

travel for buses, except that the condition is achieved at the expense of congested autos behind the ramp control devices (and on nearby arterial streets in some instances) rather than at the expense of auto congestion on the freeway itself. The freeway metering project most recently implemented is on the San Francisco-Oakland Bay Bridge with controls just west of the Toll Plaza. By July 1976 the California Department of Transportation expects to have 43 miles of metered freeways in operation.

D. Fringe Parking

Parking capacity provided at outlying stations of a high-quality transit route can reduce the number of autos entering a congested area. Fringe parking is especially valuable if there is limited local or feeder service available as is the case in Central Contra Costa with respect to BART lines. Since high-level feeder service will take some time to implement, adequate parking at BART stations and other trunkline stops is necessary to attract riders to transit and save adjacent neighborhoods from the problems of saturated parking. As feeder services are improved and other conditions lessen the need for driving to trunkline transit stops and stations, parking areas can be converted to other uses such as shared commercial development or terminal expansion. Fringe parking needs are especially critical now at BART's Daly City station but problems will also occur in

Central Contra Costa and Alameda counties when Transbay service is inaugurated. Fringe parking needs are also evident in Marin for access to GGBHTD trunk bus service. To some extent improved local and feeder bus service in outlying areas can ameliorate the "transit-transfer" parking crunch which sometimes spreads into San Francisco neighborhoods. Most fringe parking capacity should be provided far from the central destinations in order to minimize auto usage and maximize transit usage. Also, outlying areas have the most reasonable land cost and availability--in San Francisco and other central city areas, scarcely any land is available or economically priced for parking purposes. As trunk and feeder bus lines are extended outward, new and often temporary parking facilities should be developed to intercept autos at the earliest possible point.

E. Carpooling

As a result of the recent energy shortages interest in carpooling has been stimulated. A number of public and private organizations are aiding workers in establishing carpool arrangements to eliminate the one-occupant auto habit which wastes fuel and clogs highways. Since many of the benefits of carpooling appear to the user somewhat abstract or limited (e.g., benefits to society of less air pollution, out-of-pocket costs vs. long-term costs), significant moves toward carpooling have been dependent on

decisive change in the personal decision-making context including long waits for gasoline. Another decisive factor is the preference which could be offered to carpoolers (as is done on the San Francisco-Oakland Bay Bridge) of using the fast-transit-only lane. This option should be used when conflicts with transit vehicles are not severe. Carpool preference on metered ramps is a more difficult problem which should be addressed by TCC and CALTRANS in their current planning work. To further encourage carpooling, carpool participants should be given priority in parking including preferential locations and rates.

F. Transit Promotion

Possibly the most readily implemented transit promotion tool will be the publication of the long-overdue regional transit guidebook patterned after Ride On, published earlier by a Stanford group. Such a book will contain schedules, maps, rates, etc. on all public transit service in the Bay Area and on connections to other regions, and will be made available at a low cost. This guidebook proposal is currently seen as a high-priority work item of the MTC-Transit Federation (an MTC advisory group) and may become a reality within the next year. Improved transit information in telephone books should also be a high-priority public information objective of the Federation.

A second high-priority transit promotion strategy of the MTC-TF is to develop a regional telephone information

service for transit, preferably utilizing a toll-free number. Operators would be capable of providing information on all transit services. Additional longer range transit coordination and promotion programs are listed in Chapter VII: Improvements in Transit Coordination.

H. Validated Transit Tickets

Employers and business could begin to participate in the subsidization of their employees' and customers' transit expenses as they have in the past supported automobile expense by providing free/inexpensive parking and per-mile auto operating reimbursement. This kind of transit subsidy could take various forms such as provision of tickets directly to customers, pre-paid transit passes rather than parking privileges for employees or inclusion of transit tickets in admission costs to public events (sports, cultural events, etc.).

Summary of Low-Capital Intensive Programs

The most promising short-term inexpensive improvement to the Region's public transit system is to implement a coordinated system of transit preferential streets. Indeed, we believe this represents a significant improvement in our total transport system's ability to move people. It is in this area that a major effort should be concentrated in the next two years. The Traffic Coordinating Council should take the

lead in promoting this program in cities other than San Francisco; local governments should be primarily responsible for implementation.

DESCRIPTION OF TRANSIT PLANNING

The availability, beginning in 1968, of Federal grants for transit planning studies from the Urban Mass Transportation Administration significantly improved the status of planning and programming transit system improvements. Previously little had been done, with the exception of planning the basic BART system, other than to maintain transit systems in a relatively stable condition. With little possibility of funding new transit capital or operating costs nor strong public advocacy of massive transit improvement, there had been little motivation to plan system improvements. To some extent the capital funding situation has now been alleviated, stimulating new capital investment planning programs. Still, the operating cost problem remains severe. Moreover, since adding new transit equipment (as distinct from replacement) almost always leads directly to increases in operating costs, many suggested capital improvements have not yet been implemented.

The first part of this chapter describes the transit planning studies recently completed or underway which are relevant to the regional transit development situation. While MTC may not have yet fully evaluated nor formally endorsed these plans in

whole or in part, nor incorporated them into the Regional Transportation Plan at this writing, they are nevertheless proposals which must be considered. The second part of this chapter consists of a number of additional transit needs not yet studied in detail but identified by MTC staff or others as worthy of further investigation.

As many of the planning studies discussed in this chapter are either just beginning or not yet completed, it is not possible to do definitive evaluations of proposed plans. However, some preliminary evaluations, based upon the status of the planning and initial findings of the studies, have been made to measure the transportation system impact of proposed facilities. The basis for the preliminary evaluations of studies underway and the evaluations themselves are found in Chapter VI.

PART A: CURRENT AND PAST TRANSIT PLANNING PROJECTS

MARIN COUNTY

1. Optimum Bus System

The Marin County Transit District produced in 1969 the report Optimum Bus System, a plan for the replacement of Greyhound commute bus service to San Francisco with an upgraded publicly owned system as well as providing local bus service within Marin County. The Golden Gate Bridge, Highway and Transportation District (GGBHTD) later (1971) implemented

basically this plan, including the local service in Marin. Trans-Bay bus routes were also established to Sonoma localities along U.S. 101 as far as the northerly outskirts of Santa Rosa. The Marin County Transit District (MCTD) is currently responsible for partially funding local service operating deficits through an agreement with GGBHTD. The MCTD has thus far limited its role to a funding, not operating, agency. The GGBHTD also implemented ferry service to Sausalito from San Francisco's Ferry Building in accord with this report and studies by Arthur D. Little, Inc.

2. Golden Gate Corridor Long-Range Transportation Alternatives

Studies completed in 1971 on long-range surface transit for GGBHTD proposed various alternative choices. Most involved major programs of subway construction within San Francisco. In summary, the following recommendations were adopted:

- a) Utilize buses traveling on an exclusive right-of-way as the heart of the system in Marin and San Francisco;
- b) Remain flexible in structural engineering to accommodate other vehicle types in the future;
- c) Develop limited-pollution bus vehicles as soon as possible for underground use;
- d) Utilize the abandoned right-of-way of the Northwestern

Pacific Railroad in Marin County as the basic route of a bus-only roadway;

- e) Place strongest emphasis on determining and constructing the San Francisco portion of the route, as it is here that the interim surface bus system is most presently impeded by auto congestion.

The report estimated that the recommended system would cost in total \$494 million. Of this, \$204 million* would purchase the San Francisco (largely subway) section and \$66 million would be required to add a second deck to the Golden Gate Bridge. It was proposed that the second deck, the vehicle design and development, and the San Francisco Subway section would be operational by the end of 1976, and that by 1980, 273 transit vehicles would be in trans-bay service (440 by 2015).

3. Golden Gate Commuter Ferryboat System

The above titled report was completed in 1971 by consultants to the GGBHTD. It recommended development of a ferry system between San Francisco's Ferry Building and several Marin County terminals, most notably Larkspur which is the first new terminal planned to be built. The GGBHTD already operates ferry service to Sausalito; this would be improved and the District could assume service to Tiburon should the current private operator ever

*Costs estimated here and elsewhere in this chapter are current-year non-inflated unless stated otherwise. Operating costs are annual figures at 1974 rates, assuming immediate service implementation. Service implemented in the future is of course subject to higher and continually rising operations costs.

quit. Ultimately ferry service was to be provided to northern Marin County via terminals at Black Point and Las Gallinas Creek. The GGBHTD elected to purchase three vessels with 750 passenger capacity at a cost of around \$4 million apiece to be placed in service between San Francisco and Larkspur. The Larkspur Terminal would also need to be constructed immediately. While the ferries are under construction and due for delivery in the Summer of 1974, the terminal work has yet to commence as the project is still dealing with environmental problems and cost escalation. The latest cost estimate is \$13.5 million for the terminal. The service when operative will consist of departures each 30 minutes by one of the three boats, traversing the distance between San Francisco and Larkspur in 40 minutes and allowing 5 minutes boarding time at terminals.

4. Ferry Bus Feeder System

The GGBHTD commissioned a study of a system of local bus routes to transport patrons from Central Marin to the Larkspur Ferry Terminal. A feeder bus system was designed, consisting of over eight local routes tailored to ferry arrival/departure times (i.e. 30 minute headways). As yet this project has not been implemented pending institution of ferry service. Its cost is estimated as \$1 million capital and \$650,000 operating costs annually, assuming full-size buses on 8 routes.

5. Marin County Balanced Transportation Program - Phase II

This report, A Transportation Plan for Marin, released in

June, 1972 was a major achievement of the Marin County Balanced Transportation Planning Program. The report recommended that for Trans-Bay (to San Francisco) transit service, 300 buses operate by 1990. The buses were to operate ultimately on an exclusive busway similar to the recommendation "3-A" of GGBHTD's 1971 report, but in the interim were to operate on a reserved lane of U.S. 101 wherever this facility was eight lanes wide. However, in contrast to the GGBHTD report, it was stated that no second deck for transit should be built on the Golden Gate Bridge. Other Trans-Bay transit service was assumed to be the GGBHTD ferry system from Sausalito, Tiburon, Larkspur, and by 1990 from Las Gallinas Creek.

The provision of local transit service was proposed to be accomplished by the acquisition of 350 local buses by 1990, at least half of which would be smaller than conventional size. Twenty-three miles of exclusive busway would be needed by 1990 to facilitate the movement of local and Trans-Bay buses on local streets. The recommendations on local service are by far the most radical since the main transit service in Marin County now is Trans-Bay. The cost of the program would be about \$30 million capital and \$22.5 million operating per year in 1974 dollars for the full system.

6. Marin County Local Transit Capital Improvement Programming

Marin County's Balanced Transportation Program received UMTA study funding to prepare local transit capital improvement

programs for a short and middle range time frame. A final report on the short-range program (2-3 years) was released in January 1974. It contained recommendations for expanding local transit coverage and intensity, proposing to serve 67% of the east Marin urban corridor vs. the current 45%. Service would be provided by 25 regular size and 18 mid-size coaches beginning service in January 1975. The cost of the program would be \$2 million for capital equipment and \$3.9 million for operating cost for the first year which would be partially offset by \$1 million in fare revenue. Critical to the implementation of this service is the passage by the electorate of a 25¢/\$100 assessed valuation property tax in June 1974. Alternate sources such as Transit Development Act Funds are not likely to be sufficient to support the expanded system. At the present time no determination has been made as to whether the local service will continue to be provided by contract with the GGBHTD or whether the Marin County Transit District will become an operating agency. Work on a mid-range (6-10 year) capital improvement program will begin shortly.

7. Golden Gate Recreational Travel Study

A full study of transit potential for handling large volumes of recreational travel is now underway through MTC sponsorship with seven other agencies including Marin and San Francisco, the National Park Service and GGBHTD. This study was initiated primarily because of the recent creation of the Golden Gate

National Recreation Area (GGNRA) in Marin County and San Francisco. One of the first urban-area national park facilities, GGNRA is expected to attract many visitors in the coming seasons, especially if gasoline shortages discourage tourists from longer trips. The focus of the study is plainly on immediately developing transit as a viable means of travel to and within recreation sites with special emphasis on providing access to the inner-city residents. Various experimental programs will be conducted over the coming summer 1974 in order to test strategem to get recreationists to utilize transit. This need is especially strong in Marin where highways are inadequate and likely to remain that way by public preference. We roughly estimate the cost of this project to be \$390,000 in operating costs annually (mainly using other operators' equipment) and an allowance of \$750,000 for improvements such as transit preferential streets, fringe parking, and public information.

SONOMA COUNTY

1. Santa Rosa Local Transit Service Project

In 1972 the City of Santa Rosa and MTC sponsored a local transit improvement plan using UMTA study funds. A consultant developed a plan with recommendations to upgrade the small city bus system by addition of one route, public takeover of two private routes, and replacement of equipment. The plan's proposals are in the process of being implemented with buses on order and private operators having been assimilated into the municipal

system. The degree of increased service is limited, however, by the usual dilemma of operating costs and a small city's inability to finance them.

2. Sonoma County Balanced Transportation Study

The County is in the midst of a large scale multi-modal Balanced Transportation Plan with partial funding from UMTA. As yet no specific recommendations have resulted from the study as effort has focused on inventories and study design.

3. Petaluma Local Transit Planning Project

The GGBHTD is sponsoring a study of local transit service in the City of Petaluma using Transit Development Act Funds. The study, expected to be completed shortly, will assess the feasibility of providing local bus service in the community while also serving a feeder function to the GGBHTD Trunk buses to San Francisco and Santa Rosa. Similar studies are also slated for Rohnert Park and Cotati, the other remaining areas of Sonoma County most needing local transit service. One of the prime issues of these studies will be the proposed method of financing. In order to supply local transit service, GGBHTD currently requires a locality to offset operating losses. In the case of Marin County, the Marin County Transit District makes up the loss through its property tax. Either the Sonoma municipalities would have to pay directly to operate the local transit service, persuade Sonoma County to do it, or convince the GGBHTD to alter its position on funding.

SOLANO COUNTY

City of Vallejo Transit Study

The City of Vallejo, the major urbanized area of this County, conducted a study of local transit service jointly with MTC utilizing UMTA study funding. The City has contracted for six transit routes with headways of at least forty minutes. The transit equipment, acquired when the city bought out the private operation, is rather antiquated and new buses are now on order to implement the study's recommendations. The study recommendations, released in early 1973, included provision of city-wide service at thirty-minute headways, restitution of service to the City of Benicia, development of a public information/marketing program, and operation of various demonstration projects such as a subscription feeder bus to the Mare Island Ferry.

NAPA COUNTY

1. City of Napa Local Bus Needs and Planning Study

The City of Napa and MTC commissioned a consultant to prepare a plan, using UMTA funds, to upgrade the local bus system which previously consisted of one bus operating over two routes in this city of over 40,000 population. The consultant recommendation was to implement a fixed route transit system with two buses running on two routes. The cost of this program is estimated at \$208,000 (capital) and \$344,000 (operating deficit) over 5 years. These costs include addition of a third bus and route after one year. The City of Napa is the operator of the bus system having

bought out the private operator earlier and will require an annual subsidy in excess of \$63,000 commencing in FY 1977-78.

2. Napa County Balanced Transportation Program

As in Sonoma County, Napa County planners are undertaking a multi-modal transportation planning program utilizing funds from the Transportation Development Act. However, the project is not far enough advanced to have yielded any findings for inclusion here.

CITY AND COUNTY OF SAN FRANCISCO

1. San Francisco Improvement Plan for Transportation

This report was published in 1971 by the San Francisco Department of Planning and contained recommendations for public transit and highway facilities over short and long-range periods. The plan generally seeks to foster a transit-first policy in the decisions made on city-wide transportation issues. Very few highway improvements are recommended other than those which can facilitate transit vehicle operations. A program of transit preferential streets is outlined including grade separations, lane restrictions, etc. to speed transit operations in auto-congested corridors. The other category of high priority transit improvement is in rail transit extensions. Those proposals are, by time period, as follows:

a. 1971-1975

- Begin engineering of subway to Richmond District
- Complete BART extension from Daly City to S.F. Airport

- Extend K and M streetcar lines to BART Balboa Park Station
 - Complete cross-Sunset streetcar line connection
- b. 1976-1980
- Construct Richmond Subway
 - Design subway from Sunset tunnel to 9th Avenue
 - Study rail line along Bayshore Avenue to S.F. Airport
- c. 1981-1985
- Study extension of Richmond subway to serve Marin County
 - Construct Sunset subway to 9th Avenue
 - Begin construction of Bayshore rail line
- d. 1986-1990
- Complete Bayshore Line
 - Begin construction of Richmond transit line extension to Marin County

The report also summarized MUNI's current and proposed operations planning and suggested some route changes to increase efficiency. Emphasis was placed on converting the downtown street grid into a network more oriented to transit and commercial traffic by deemphasizing auto use. Finally, it was recommended that the subsidized 25¢ fare be retained to encourage continued and increased patronage. The following three studies can be seen as direct outgrowths of the transportation improvement strategy of this report.

2. Transit Preferential Streets Program

Three City Departments (Planning, Public Works, and MUNI)

jointly prepared a detailed report for implementing the first transit preferential street improvement program. The report, released in late 1973, is now being considered for implementation by the Board of Supervisors; major changes in the operation of surface streets should be instituted by the end of 1974. The planning of transit-preferential treatment of surface streets will be carried on to new thoroughfares and using new techniques, especially as experience with the first round of improvements is gained. Current proposals call for about six miles of street right-of-way to be altered, at an approximate capital cost of \$100,000.

3. Northwest San Francisco Transit Extension Project

The City and County of San Francisco, BART, and MTC are jointly sponsoring this program to design an improved transit system in the Northwest sector ("Geary Corridor") of the City. The study, begun in late 1972, is being supported by a grant from UMTA. Being considered are transit improvements ranging from a minor upgrading of surface bus lines to a BART rail system in varying degrees of below-grade construction. At the present time the BART-type system has been abandoned as an alternative for various technical reasons. It is assumed that the MUNI-Metro rail system can provide the capacity of a BART-type system with better operating performance. Also being considered by this study, in cooperation with the planning of the Golden Gate Corridor Planning Project, is the possibility of accommodating the transit load

from Marin and Sonoma counties via a Geary Corridor facility. This alternative could take two forms: either a combined route system sharing a common excavation with no mixing of vehicles or passenger loads; or, a functionally-combined alternative involving a transfer of Northbay commuters at a transfer station near Geary Avenue and Park Presidio Boulevard. The study is approaching a critical period of public hearings on alternative plans in May. Final recommendations should be known by the end of summer 1974, and work would then proceed to preliminary engineering of the facility selected.

4. MUNI Management, Operations, and Marketing Project

The MUNI is about to embark on a UMTA-funded technical study in cooperation with MTC to plan a short-range operations improvement program. The scope of the study will also include added preferential transit treatment of streets in conjunction with the ongoing program of the City Planning Department and recommendations for improving the management structure of MUNI both internally and in terms of relationships with other agencies and operating departments. Also, a transit marketing program will be developed aimed at improving ridership through better public information and other techniques. The scope of the study is very broad as it is intended to consider the host of MUNI's operating problems which must be overcome in order to offer MUNI patrons significant service improvements.

5. BART-MUNI Coordination Study

A detailed description of this study can be found in Chapter III

of this report where transit coordination programs were discussed. Recommendations have been prepared to integrate BART/MUNI scheduling, line operations and system transfers.

6. Trans-Bay Terminal Study

The California Department of Transportation sponsored a study of this terminal, presently used principally by A-C Transit. The State, owner of the facility, wants to determine the future of the terminal once BART Trans-Bay service commences and A-C operations diminish. The major possibility being considered is the use of the terminal as a multi-carrier transportation center improved by using proceeds from lease of air rights for construction of buildings. Carriers who would prospectively use the terminal would be GGBHTD, buses from San Mateo County, residual A-C Transit Lines and private inter-city lines.

7. Golden Gate Corridor Transit Planning Project

In 1972 this project began studying in detail the San Francisco segment of the Golden Gate Corridor in accord with priorities established in GGBHTD's 1971 study. This project, partially funded by UMTA, is governed by a GGBHTD/MTC/San Francisco Board of Control. Its focus from the beginning has been to determine the best underground routing for Trans-Bay buses of GGBHTD between the Golden Gate Bridge and San Francisco's Financial District. Although the study was to be completed and a route selected in 1973, it is presently at a standstill. Delays and unforeseen problems have added to the cost of the program and supplemental funding is being

sought. At the present time several candidate routes are being considered ranging from Geary Avenue to a route through the Marina District.

In addition to the subsurface alternatives, the study was required by citizen initiative to investigate an underwater tube between downtown San Francisco and Marin County in order to avoid the community disruption involved in subway construction. Also added to the study was a detailed evaluation of a low-cost surface alternative, i.e. transit preferential treatments of surface streets with limited capital improvements at bottlenecks. Finally, an alternative which has to be considered is a transfer of Golden Gate patrons to a rapid transit system in the Geary Corridor, a plan being jointly researched with the Northwest San Francisco Transit Extension Project.

The alternative plans are not yet totally evaluated as to cost, impact, patronage, etc. However, a rough estimate can be made for capital cost of the subsurface alternatives of \$500 million, or \$1 billion for the subaqueous tube. The low cost alternative may be constructed for \$100 million or potentially much less. No improvements to the Golden Gate Bridge are included in these costs; the transit vehicles are assumed to operate on an exclusive lane on the existing bridge deck. The costs do include terminals, especially in downtown San Francisco or a transfer terminal to the Geary Line. Inasmuch as the high-cost alternatives can be staged, it is possible that the low-cost alternative could

be implemented initially with a phased upgrading to a semi-grade separated system over a period of years, either as a separate system or combined with the Northwest Project. The subaqueous route appears to be unjustifiable on a number of counts including its inordinate expense.

SAN MATEO COUNTY

1. West Bay Rapid Transit Authority Study

The West Bay Rapid Transit Authority was created by the California State Legislature in May 1964, with a concurring resolution by the San Mateo County Board of Supervisors. The primary objectives of this authority were to assess the need for improved public transportation in San Mateo County, to determine the costs of various alternatives, and to assess the value of benefits accruing to county citizens as a result of expenditures to improve transit service. To fund this endeavor, San Mateo County enacted a temporary vehicle license fee tax.

As a result of the study, completed in December 1968, it was recommended that the Authority take action on three fronts:

1. Establish a publicly owned, county-wide bus service;
2. Initiate cooperation with San Francisco and others to provide rail rapid transit service to the San Francisco airport from Daly City;
3. Adopt a plan which would provide for the eventual extension of regional rail transit through San Mateo County.

Capital cost estimates in 1968 dollars were made by the study for each of the three recommended elements. The county-wide bus service, considered to be the "minimum in essential transit improvements", was valued at \$17.5 million. Rapid transit access to the airport was estimated to cost \$120 million, with full county rapid transit service set at \$350 million.

County voters did not approve this master plan in a June 30, 1969 ballot and the Authority was abolished consistent with the act which created it.

2. San Francisco Airport Access Project (SFAAP)

This report published in October 1972, presents the recommended plan for extended rail rapid transit service in northern San Mateo County from the present BART terminus in Daly City to the San Francisco International Airport. Estimates of patronage, revenues, operations, maintenance, and capital costs were made. Alternative means of implementing and financing project activities were also discussed.

Three agencies supported this study: the City and County of San Francisco, San Mateo County, and the Bay Area Rapid Transit District. The report was financed in part by the U.S. Department of Transportation (UMTA).

The following line features were recommended by SFAAP:

- An 8-mile extension of BART-type rail service from the Daly City terminus generally by way of El Camino Real

and the MUNI R.O.W. into the planned airport terminal via subway. The extension involves a total of four stations including ones at Colma, South San Francisco, San Bruno and the San Francisco Airport (SFO).

- Basic operations features (headways, routing, travel times, train control, power distribution, fare collection) would be directly compatible with the existing BARTD system.
- 41 new BART-type cars would be required to meet 1980 service demands.
- A new transit car yard is needed in Burlingame of approximately 5 acres.
- 1980 annual patronage on the 4-station line totals 12.891 million.
- Net revenue (surplus) of \$4.4 million is projected for the line in 1980.
- The capital cost estimate for system construction from Daly City through Millbrae just south of the airport was estimated at \$384.6 million, including \$95.2 million for inflation.

Various implementation alternatives between the three parties sponsoring the study were also discussed as a means of getting early action on the proposal. Although capital cost estimates

have recently been updated by the San Mateo County Transit Development Study, the recommended line and station configuration from Daly City to the airport remains the same.

3. San Mateo County Transit Development Project (SMCTDP)

The SMCTDP study was undertaken subsequent to the SFAAP study (above) when it became increasingly apparent that rail rapid transit south of the airport might also be warranted. It was felt that San Mateo County and the Region should know the plan, impact, and cost of rail rapid transit throughout the urban corridor on the Bayside before agreeing to any project implementation between San Francisco and the airport.

SMCTDP was thus established to study the extension of the proposed rail rapid transit route from San Francisco International Airport to the southern boundary of San Mateo County. The study was established in June 1971 through a joint powers agreement between MTC and San Mateo County with financing in part from the U. S. Department of Transportation (UMTA).

Although analysis focused most heavily on the cost, configuration, and service aspects of the rapid transit line south of the airport, the draft final report presents information regarding the entire peninsula extension from Daly City through SFO to Menlo Park. The following line features are described by SMCTDP:

- A 17-mile extension of rail rapid transit service from San Francisco International Airport via subway to

Millbrae and thence generally by way of Southern Pacific Transportation Company right-of-way south to Menlo Park and the San Mateo County border along San Francisquito Creek. The extension includes eight stations serving the cities of Millbrae, Burlingame, San Mateo, Hillsdale, Belmont, San Carlos, Redwood City, and Menlo Park.

- As with SFAAP, basic operations features would be directly compatible with the existing BARTD system. Automatic train control would probably be provided in a satellite facility with direct communication and interfacing with BARTD central control in Oakland.
- 157 new BART-type cars would be needed to service the entire peninsula extension (Daly City to Menlo Park)
- A new transit car yard in Burlingame (Millsdale) as recommended in SFAAP with rail car maintenance and crew facilities, and an operational capability to store 200 rapid transit cars would be required.
- 1985 annual patronage on the 12-station peninsula extension from Daly City to Menlo Park would range from 30.3 to 38 million.
- Net revenue (surplus) of from \$8.9 to \$15.3 million (1973 dollars) is projected for the full peninsula extension in 1985.

- The capital cost estimate for system construction from Daly City through Menlo Park is estimated at \$809 million, including \$245 million for inflation. The Project could be staged over a 10-year period.

Due to the substantial street and freeway access requirements which the terminal station would require, SMCTDP recommends that this extension be terminated at Redwood City rather than Menlo Park. This arrangement would permit good automobile and bus access, and an opportunity for direct transfer with SP commuter rail service south to San Jose. Total capital costs have consequently been scaled back to an estimated \$789 million: Daly City-Redwood City.

A wide variety of social and economic effects stemming from rapid transit extension along the Bayside of the peninsula are included in the study, including the impact on other transportation systems. A separate EIR is one element of the recommended 10-year development scheme. Earliest possible commencement on project activities is set at July 1975, with subsequent revenue operations on the peninsula extension beginning in 1984.

4. San Mateo County Local Bus Transit Study

This study was established in May 1973 through an agreement between MTC and San Mateo County. Its basic purpose is to determine the types of service and the service areas for surface transit in San Mateo County to meet present and future needs

and to support the overall development goals of the county. The Study also plans to establish how the service can be managed and financed within the county's capability.

The major service concept alternatives discussed are:

1. Do nothing, continue present development by the various municipalities within the county;
2. Gradually improve service by coordinating present services and adding service as warranted;
3. Implement a comprehensive local bus service for the entire county.

Initial study recommendations for alternative #2 include fixed route services in combination with demand-activated and special services estimated to cost \$3.5 million to acquire and build. Operating costs are set at \$4.3 million annually.

Recommendations for alternative #3 center around a full fixed route service (51 routes) involving approximately 220 buses. Capital costs are set at \$27.3 million with annual operating expenditures estimated to be \$6.2 million.

Although these specific study recommendations are still in an early stage of development, the present initiative to create a county-wide transit district has been undertaken in direct response to these proposals. It is generally agreed that with

voter approval of a transit district, an obligation to implement some level of county-wide bus service is incurred.

5. Southern Pacific Upgrading Feasibility Study

Subject to Resolution No. 66 of the Metropolitan Transportation Commission, the MTC has "undertaken to conduct a study to investigate the political and legal implications of integrating the existing Southern Pacific commuter service for the city and county of San Francisco, San Mateo County, and Santa Clara County into the Bay Area Regional Transportation System". It is the purpose of this study to further explore the feasibility of various levels of service upgrading through public assistance.

The study will provide a determination as to operational, financial, and legal feasibility of upgrading to the designated levels of service. Improvements capable of augmenting patronage will be investigated. Southern Pacific's future rail freight requirements and other demands on its peninsula line will also be taken into consideration.

A requirement of the study would be that the optimum quality rail service patterns to be developed would constitute part of an integrated regional system. The feasibility evaluation will assume rail operations employing the best current equipment, methodologies, and marketing techniques as a fitting (though not equal) alternative or complement to a regional rail rapid transit system.

As with SMCTDP, the S.P. Upgrading Study is being undertaken so

that the Plan, impact, and cost of this alternative for rail rapid transit development throughout the corridor could be determined before any rapid transit project implementation decision was made by the three involved counties or by MTC. Study activities are scheduled over a 6 month period ending June 1974. At this point only rough estimates of costs can be made ranging from \$50 million capital for a minor upgrading (primarily rolling stock), to \$1,000 million capital for a major upgrading including, rights-of-way, station improvement and construction, grade separations, and extensions to downtown San Francisco and into the airport.

SANTA CLARA COUNTY

1. San Jose - Santa Clara County Bus Study

The stated objective was "to assist in achieving a much improved and coordinated county wide public bus system needed to assure a balanced transportation network and optimum mobility for county residents". A 3-phase transit plan was recommended in June, 1969:

1. Formation of a county-wide transit district and operating authority;
2. Purchase of private local bus companies (San Jose Lines, and a portion of Peerless Stages);
3. Establishment of expanded service utilizing 325 buses operating over 1,052 route miles at a 25¢ base fare.

The total capital cost for this system, to be paid in two installments, was estimated at 14.9 million. Average annual operating

costs were set at \$8.5 million (non-inflated).

2. East Valley Mobility Study

The objective of this study was to recommend public transportation services for the East Valley area of Santa Clara County - an area with an especially high percentage of low income households. A "demand-actuated" bus system in which residents phone a dispatch center was recommended due to low population density and large geographic area.

A 16 hour daily operation was recommended requiring 13 vehicles and 22 drivers, with a proposed base fare of 25¢. Estimated annual operating costs would lead to operating deficits approximating \$564,000 based on this fare structure.

3. Santa Clara County Bus Transit Corridors Study

This study was made in response to the actual formation of the Santa Clara County Transit District (SCCTD), in order to recommend the initial bus transit system which was to be implemented. The study recommended the following bus corridor network:

- 270 corridor miles of service comprising 600 route miles.
- No service outside of Santa Clara Co. except for limited service into San Mateo Co.
- Vehicle requirements: 200 units of which 10 were to be for demand-actuated service.

- Operations at 15-30 minute peak headways, 30-60 minute off-peak headways. Weekday service from 6 AM - 10 PM with less frequent weekend service.
- Operating personnel requirements: 440 operators and staff.

4. Santa Clara County Rapid Transit Development Project

The fundamental goal of the Santa Clara County Rapid Transit Development Project is the development of a public transportation system both within the county and as part of a regional system that will compete effectively with the private automobile. The study revolves around an adopted goal of ultimately attracting 30% of all travel onto public transportation in the county (approximately 1 million trips daily).

Four areas of study will be scrutinized over the two year project duration to ascertain the feasibility of attaining this ambitious goal:

- Technology alternatives as they relate to market penetration, public acceptance, physical cost, and operating impacts. This element is considered to be most critical, especially where new technology systems are concerned (i.e. a Personal Rapid Transit System). While emphasis will be placed on corridor system decisions, the requirements of local travel and of collection/distribution will not be overlooked;

- Transit system performance attributes centering around safety/reliability, time savings, cost savings, convenience, comfort and others;
- Economic feasibility and financing, to ascertain the key to the formation and implementation of an effective financial plan in order to channel large scale savings from reduction in automobile costs into public transportation. It must be proved that private cost savings justify public investment;
- Evolutionary staging, incorporating a staged development strategy for a system likely to cost several billion dollars. (A county-wide PRT system could amount to a capital cost of \$1,600 million and a regional hook-up via a BART-type system \$1,030 million, with operating costs of \$24 million and \$17.25 million respectively.)

The study was established through an agreement between Santa Clara County and MTC.

CONTRA COSTA COUNTY

1. Pittsburg-Antioch BART Extension Study

This project was undertaken as one of three rapid transit extension studies within BART's three county district. The study is being conducted under a Joint Exercise of Powers Agreement between MTC, BARTD, and the cities of Pittsburg and Antioch, with Financial assistance from the Urban Mass Transportation Administration.

The study's purpose is to develop and recommend the optimum system configuration for extending BART rapid rail service into the urbanized portions of north-central Contra Costa County. Two population centers, Pittsburg and Antioch, are situated in this area of the county.

At this stage of work, the consultant has chosen two main alternative routes for further study, both of which extend from BART's present terminus in Concord. Initial study findings recommend the following system features:

- A 20 mile extension of BART rail service from the Concord terminus north to S.R. #4, turning eastward within the median of that highway and proceeding to the vicinity of Antioch. One alternative route would remain in the freeway median through Antioch, while the other would leave the median to pass through the central sections of Pittsburg and terminate near the waterfront in central Antioch. Both alternative routes consist of 4 stations serving the vicinities of North Concord/Martinez, West Pittsburg, Pittsburg and Antioch. The downtown route includes an optional routing through Clyde and Port Chicago.
- Basic operations features would be directly compatible with the existing BARTD operations on its Concord line.
- Additional BART cars ranging from 49 to 52 units would be needed for the Concord line.

- A transit car yard with vehicle service and crew facilities together with a storage capacity for 100 rapid transit cars would be required.
- Capital cost estimates range from \$139 million to \$143 million (uninflated). This does not include the cost of associated highway improvements which might be required on California Route 4. The annual operating cost would approach \$7 million.

Contra Costa County Local Transportation Implementation Program

This study was created under a Joint Powers Agreement between MTC, BARTD, AC Transit and Contra Costa County. Project financing is supplied in part by a grant from the Urban Mass Transportation Administration.

The general purpose of this project has been the development and implementation of a local bus system for urbanized portions of Central Contra Costa County. Two system concepts were studied: 1) Manually dispatched, demand-actuated transit service for broad areas of the county; 2) Fixed bus routes to meet peak hour demands in certain corridors.

This program implements a major recommendation of the 1971 Contra Costa Transportation Needs Study for demand-actuated transit services. This program effort goes beyond system design to develop required operating procedures, a marketing and public information program and specifies necessary managerial, institutional, financial and legal arrangements necessary in setting up the system.

Early study results recommend the following system features:

- 12 fixed routes for bus service (including 4 modified BART bus express routes).
- 9 areas for demand-actuated service (Martinez, Pittsburg, Antioch, Pleasant Hill, Concord, Clayton, Lafayette, Walnut Creek, and Danville.)
- Fixed route, weekday ridership estimated excluding BART express buses: 9,170 patrons

More refined system design specifications together with the various other study elements will be forthcoming in later phases of the study. Project activities commenced in October, 1973.

Walnut Creek Transportation Terminal Planning Project

This study was begun as the result of the Joint Powers Agreement signed by the City of Walnut Creek, MTC and BARTD with financial assistance from the Urban Mass Transportation Administration.

The principal purpose of this study is to develop specific plans for multi-modal transportation terminal facilities on the BART station site in Walnut Creek. In addition to determining the functional redesign of the station site required to accommodate a variety of transportation modes, it is necessary to coordinate the study with Contra Costa County's Local Transportation Implementation Program. This county study could lead to early implementation of local and feeder transit service, thereby

affecting the demand for terminal facilities. The Terminal Study will also be integrated with the BART station area plan (conducted concurrently by the City of Walnut Creek). The station area study will provide land use, circulation and design policies, and a program for their implementation in the area immediately surrounding the BART station. Project efforts commence in October 1973, and are anticipated to be complete by late Spring 1974.

El Sobrante Transit Project

This project will be established and administered under a Joint Powers Agreement between MTC and AC Transit. Representatives from BART, the cities of Pinole, Richmond, San Pablo and El Cerrito, and Contra Costa County will participate. Funding assistance is anticipated from the Urban Mass Transportation Administration.

Because of its terrain, street pattern, and location in relation to mainline services operated by AC Transit, the El Sobrante area presents difficulty in terms of being provided adequate transit service. For the most part, residents must travel outside the area for shopping, employment, recreation, a BART station, and other community facilities. The 3 major objectives of the study will be:

1. To survey transit needs in the study area;
2. To develop a plan of improved services, suitable for implementation;

3. To coordinate such plans with existing local and regional transit services operated by AC Transit and BART.

5. A-C Transit/BART Coordination Study

This study, funded in part by UMTA and jointly conducted by MTC and the two operators, has developed a coordinated service evaluation methodology and proposals for integration of services especially designed to take effect upon the opening of BART Trans-Bay service. A Dial-a-Ride system is also being planned for Richmond. See Chapter III, Part 5 (Coordination of Transit Systems) for additional details.

ALAMEDA COUNTY

1. Oakland Airport Transit Access Project (OATAP)

This study was carried out under a Joint Powers Agreement between MTC, BARTD, the City of Oakland, Alameda County, and the Port of Oakland, and was completed in June of 1973. Funding was made available in part by the Urban Mass Transportation Administration.

Based upon forecasts of rapidly increasing Bay Area air travel demand and the geographically central location of Oakland International Airport (OIA), regional studies of aviation requirements have forecast high growth rates here in the coming years. A Joint Exercise of Powers agency was created in 1969 to examine the feasibility of transit service between OIA, BART,

the Coliseum complex, and the Port of Oakland. The report, which was completed in October 1970, recommended a separate shuttle system between the BART Coliseum Station and Oakland Airport. Since no agreement could be reached on this recommended system, a second phase study was initiated.

The stated objective of this second phase study (OATAP) has been the development and analysis of two basic systems for providing transit access to OIA:

1. An airport shuttle or "connector" system operating between BART's Coliseum station and OIA;
2. A direct extension of the BART System into OIA following BART mainline criteria, and using an alignment which leaves and returns to the existing BART line.

The following system configurations were forwarded by the report:

Connector

--A 3.9 mile system utilizing (only for cost estimate purposes) vehicles on a concrete guideway capable of 50 mph speeds would carry passengers nonstop from BART Coliseum station to OIA. Each vehicle could carry 36 passengers, and could be joined into trains of up to 4 cars each. Peak hour headways of 1 minute could be maintained. Train Control would be automatic from a remote control center, and a storage/maintenance facility occupying 6.9 acres would be required.

--Facility and equipment cost for the connector mode over a 5-year period 1974-78 is set at \$74.94 million.

BART Extension

--A branch line of the main system 6.6 miles in length forming an open loop between Coliseum and San Leandro Stations with a four-track airport terminal station at about the midpoint of the loop. Line and station would be constructed to accommodate 10-car BART trains being switched from the mainline onto the airport loop at intervals determined by full-system operations scheduling.

--Facility and equipment cost for the BART extension over a 6-year period 1974-79 is set at \$172.37 million.

Patronage estimates and operating costs and revenues for both alternatives are similar (annual net revenues of \$1.6-1.7 million are projected for 1985).

Although no recommendation was forthcoming from the consultant, the data presented indicates that the connector alternative is more desirable than the direct BART extension. The Port of Oakland has contracted for an independent review of this study due to their disagreement with certain findings in the consultant's report.

2. Livermore-Pleasanton BART Extension Study

This project was undertaken as one of three rapid transit extension studies for BART within its present three county district.

The study is being conducted under a Joint Exercise of Powers Agreement between MTC, BARTD, and the cities of Pleasanton and Livermore with financial assistance from the Urban Mass Transportation Administration (UMTA).

The purpose of the study is to design the optimum system configuration for extending BART rapid rail service into the urbanized portions of Eastern Alameda County. Two major population centers, Livermore and Pleasanton, are situated in this area, a broad valley separated from the bulk of Bay Area population by a range of mountains.

At this stage of work, the consultant is recommending a route from the Southern Alameda BART line through Dublin Canyon and passing through the downtown areas of Pleasanton and Livermore. The following generalized line features are recommended:

- A 25-mile extension of BART rail service from BART's Bay Fair Station eastward, closely paralleling I-580 through Dublin Canyon, and into the Livermore/Amador Valley region. The line would involve 5 stations, in or near the cities of Castro Valley, Dublin/San Ramon, Pleasanton, and Livermore. Configuration will probably represent a spur line originating at Bay Fair and requiring an across-platform transfer onto trains of the central system.
- Basic operations features would be directly compatible

with existing BARTD system. Capability to switch onto main line for maintenance purposes would be incorporated.

- Capital cost estimates range from a low of \$165 million to a maximum expenditure of \$186 million (uninflated). This does not include the cost of associated highway improvements which might be required for construction. Annual operating costs (1974) approximate \$8.75 million.
- Initial patronage estimates for 1980 assign 20,701 two-way work trips to the extension on an average weekday.

A wide variety of social and economic effects stemming from rapid transit extension are included in the study work program, but have not been fully developed as of yet. Consultant efforts began in July 1972 and should be concluded by July 1974.

3. Tri-Cities Transit Implementation Project

This study is being carried out under a Joint Exercise of Powers Agreement between the cities of Fremont, Newark and Union City, MTC, AC Transit, and BARTD. Project funding is being derived in part from the Urban Mass Transportation Administration (UMTA). The purpose of the project is to implement a transit plan based on the 1971 Tri-City Transportation Needs Study by DeLeuw, Cather and Company. That study recommended three fixed bus routes supplemented by a demand-actuated transit system in Fremont and Newark, with express commute-hour-only service between a major employment center and the

Fremont BART station.

The recommended system strategy incorporates a program to monitor and adjust transit services over time as the population of the area expands and as operational experience dictates. Coordination is being effected with current and proposed transit planning projects in adjacent Santa Clara County.

Project efforts are being conducted within four task categories:

1. Preliminary work aimed at establishing overall project objectives, evaluating the earlier Tri-City Transportation Needs Study, identifying policy decisions, and organizing citizen participation;
2. System design wherein the actual fixed route and demand-actuated bus system will be developed including operating policies, coordination procedures and a public information program;
3. The institutional and management framework necessary to direct and control the operations of the system;
4. A financial plan capable of satisfying system capital and operating costs net of fare revenues.

The study was begun in September 1973 with anticipated completion in June 1974.

4. BART Station Development Study

This study was begun under a Joint Exercise of Powers Agreement

between MTC, the City of Oakland and BARTD with financial assistance from the Urban Mass Transportation Administration (UMTA). The project is intended to be a demonstration of rapid transit station area planning aimed at defining appropriate development opportunities. Since this is a demonstration project, certain national objectives must be addressed to help in defining a broader process of transit planning.

The following specific aims have been identified as serving local and regional needs:

1. Optimize benefits from existing and anticipated public investments in station areas;
2. Use transit-related investment to revitalize inner city neighborhoods;
3. Identify and attract new development resources to the station area, including Federal, local and private sector funds;
4. Encourage station area activities which will complement the BART regional system.

The project was begun in March 1973 and is anticipated to last 18 months.

5. San Leandro Transit Planning

This proposed project would be administered under a Joint Exercise of Powers Agreement between MTC, AC Transit, BART and

the City of San Leandro. Funding assistance will be sought from the U.S. Department of Transportation.

At this writing, the study is in its earliest stages of definition and work scope. However, emphasis is expected to center around alternative means of providing transportation services between downtown San Leandro where substantial redevelopment is being proposed and the San Leandro BART Station 1/4 mile to the west of this area.

6. Berkeley Coordinated Transit Development Project

This study has just begun its technical phase. Study objectives are to provide additional and expanded local service for the city, particularly for trips not usually served by transit and possibly including small vehicles on local streets and special purpose transit. In addition to AC Transit, BART, and the City of Berkeley, the University of California and the Berkeley Unified School District also participate in the decision making process, as they presently devote some of their own resources to transit. The study will include alternative plans for coordinating the transit operations of U.C. and BUSD with AC Transit and BART.

The final report should be completed at the end of 1974. New financial requirements are difficult to estimate as community interest will determine the level of expanded service and thus additional cost.

REGIONWIDE TRANSIT PLANNING STUDIES

1. BART Safety/Availability Study

This study was initiated through an agreement between BART and MTC, and is funded in part by the Urban Mass Transportation Administration (UMTA).

The study represents an analysis to determine how the BART system can perform the operations and maintenance of the transit system as presently designed with improved overall safety and availability of service to the public.

Four major objectives are cited by the study:

1. Determine the safety level of the BART System using measures relative to other mass transit systems and regulatory guidelines.
2. Determine system availability including satisfactory operation of equipment during its period of service.
3. Determine the level of safety and availability which includes the determination of any safety compromise generated by availability features, and any availability compromise generated by safety features.
4. Conduct a thorough review of all BART procedures that affect safety and availability and generate revisions and additions together with supporting material for consideration.

The study is anticipated to last 12 months from its starting date of October 1973. BART operating procedures will be updated subject to consultant findings throughout this 12-month period.

2. Special Transit Needs Study

This study, supported partially by funding from the Urban Mass Transportation Administration is being undertaken by MTC staff. The study objectives are to identify transit needs of the elderly, handicapped, and poor, and to recommend specific means of increasing their mobility. These transit needs are "special" when so considered by the transit industry, e.g., special fares, special design of a bus or rail facility, special routing, or special public information service.

Phase One of the study includes problem definition, criteria and issues; general estimates of need; recommendations of pilot project sites; and an interim report. Phase Two includes study and evaluation of pilot projects; review of regional need; and recommended planning input to the MTC Regional Transportation Plan. Phase one will be completed shortly; Phase Two probably will be completed near the end of 1975.

Estimates of need have been developed through reviewing similar studies in other areas of the nation, analyzing 1970 census and 1965 BATS data, and meeting with local citizen groups and social service agencies. Results from a questionnaire sent from MTC to health and welfare agencies concerning travel needs for their

clients suggest that about 85% of the agencies provide transportation services for target groups (as opposed to the general population), that lack of transportation is a problem in allowing the client to get to service locations and that the problem exists almost equally in urban (where public transit exists) and non-urban areas. About 20% of these agencies own or operate para-transit services because of this problem; most of them are having difficulties, have not met the necessary demand, and would like to withdraw from the transportation business if they could, though some would like to expand and believe that they are providing a unique service.

Also, area-wide plans for the aging (six "areas" total the nine-county region) were recently completed to meet Federal funding requirements of the revised Older American Act, and they show that in each county transportation is the key problem for the elderly among fourteen categories (such as housing, health, recreation, etc.)

Recent transit proposals not implemented and still suggesting unmet need include several city and county revenue proposals, often by local health agencies; the Oakland report "Getting to Work from West Oakland"; a demonstration proposal to UMTA from the S.F. Citizens Committee on Transportation for the Handicapped; the East Valley Mobility Program; and the Richmond Model Cities Transit Demonstration Proposal. In the last two proposals, the objectives have either been absorbed into those of a larger program (Santa

Clara County Transit) or remodeled to fit a pilot project (AC Transit Dial-a-Ride) and must be monitored by MTC to determine if additional need still exists. Several on-going MTC technical projects refer to new local bus service in suburban areas which will mostly serve low mobility groups, particularly demand-actuated programs or increased level of service, and must be similarly monitored (Berkeley Coordinated Transit Project, San Mateo County Local Bus Study, Contra Costa County Local Transportation Implementation Program and Tri-City Transit Implementation Project.)

The transportation planning process of MTC, the developing transit systems in the Region, and the concern with mobility restrictions by non-transit agencies (some with funds assigned to transportation service) are considered in this study as three dynamic factors. Pilot project sites will be chosen where new transportation institutions and organizations or new operations can be studied, or where transportation issues can be examined to review MTC objectives, policies, and priorities.

Final recommendations will have to meet criteria of the study and in some way solve existing planning issues: What is the best trade-off between programs to serve target groups and other programs? Should operational changes be made to the basic transit system to eliminate physical barriers (and thus to what level is para-transit service needed?) When can existing transit districts solve "special" needs and when should a new organization be established? To what extent should MTC be actively involved in trying to resolve the three issues above?

Even under the present situation of high deficit operations of the major public transit carriers, minimal funds can be used to further involve the carriers in special transit service using special funding sources (similar to AC Transit Dial-a-ride) and/or to offer some financial security as a catalyst to involve public and private non-profit organizations that can operate a coordinated para-transit service (such as "Whistlestop Wheels" in Marin County, or as proposed in a working paper of the MTC San Mateo Local Bus Study).

3. BART Market Segments Project

This study is being conducted under a Joint Exercise of Powers Agreement between BART, MTC and UMTA with participation from major transit operators in the Bay Area. Partial funding is forthcoming from the U.S. Department of Transportation.

The primary objectives of this project are three-fold relating to a market research endeavor:

1. To determine the degree to which market segmentation can be employed to make BART marketing more effective;
2. To identify those market segments offering potential ridership increases to BART within one of these two measurement criteria:
 - Marginal revenue - increases in revenue passengers greater than the cost to appeal to such segments

--Increased mobility - significant opportunity for new travel opportunities for segments of the population not served by current projected services

3. To tailor the transit product (where possible) to effectively reach and satisfy the needs of each specific market segment.

Project efforts are scheduled to last 18 months from beginning consultant activity in April 1974.

4. San Francisco-Sacramento Corridor Transit Study

This project was initiated by the California State Legislature and is being performed by the California Department of Transportation (CALTRANS) in cooperation with local and regional government in Sacramento and Stockton. Consideration is being given to transit alternatives ranging from upgraded express bus service to rail and air-cushion vehicle systems. Also being studied is the connection between a Sacramento link and the BART system termini, either the existing Richmond and Concord stations or the end of the Pittsburg-Antioch extension (if built). The cost of this project has only been roughly estimated at \$600,000 for an express bus upgrading or \$1,250 million for a rail rapid transit system.

PART B: OTHER TRANSIT NEEDS NOT YET STUDIED IN DETAIL

A variety of trunk and local transit deficiencies exist in the nine county region. Several of these deficiencies will be at least

partially overcome with the completion of improvement programs now underway. Notably, inauguration of BARTD transbay service, completion of the MUNI METRO subway, implementation of Golden Gate's expanded ferry service, and a variety of express bus improvements all actively being acquired and/or built will benefit many trunk transit trip needs in the Region.

In addition to these on-going improvements, planning attention has been focussed on unmet transit needs either by the operating agencies themselves or by MTC. This chapter has thus far attempted to summarize, among others, those transit needs which detailed planning studies have addressed. The outcome of these efforts will continue to provide the rationale for establishing the trunk transit element of the regional transit development program.

The weakness in this process lies in the possibility of overlooking a legitimate transit deficiency. Failure to recognize any deficiency precludes study efforts analyzing its dimensions and possible solutions. This in turn might cause the responsible agencies to ignore the need totally, thus leaving a section of the population without a necessary public service.

It is the intent of this section of Chapter V to briefly review the transit service needs which appear to be significant on a regional basis, and which are not yet being actively addressed by either the operating agencies or by MTC's planning process. As of this writing, the following transit issues are not specifically recognized by any active or pending study effort:

1. BART Extension - Fremont to Santa Clara County Border

Rapid transit planning is currently getting underway in Santa Clara County. One obvious alternative to be studied is extension of BART rail service within that county. Keeping this in mind, it seems apparent that some technical analysis should be undertaken pertaining to the extension of BART from its existing terminus in Fremont southward over the 8 miles remaining to be traversed within Alameda County. It is not now certain whether and to what level of detail this analysis will be made by Santa Clara in its study.

A similar study establishing the configuration of a 25 mile BART-type rapid transit extension south to the Santa Clara County border is nearing completion by San Mateo County in the westbay. The same effort should logically be made for Alameda County in the eastbay. The cost of the Fremont to county line (over \$150 million capital) is included in our estimate for BART extension in Santa Clara County.

2. Express Bus/Light Rail Service - City of Alameda to Oakland

The routing of BART's system through Metropolitan Oakland bypasses large concentrations of population. These areas contribute a significant number of trip movements into central Oakland, San Francisco, and other urban centers around the bay. Whereas AC Transit currently provides considerable local and transbay transit services, there exists the potential for improved trunkline services as well.

Pending study results on potential patronage, either an express

bus or light rail configuration may be appropriate. The prospective corridor follows generally along a semi-circular path connecting the City of Alameda from the southwest and East Oakland/Piedmont/MacArthur freeway corridor from the east and northeast to central Oakland and the BART regional system. A bus system (10 minute peak headway for express) in this corridor would cost \$800,000 (capital) and \$520,000 annual operating. A light rail system, partially underground, would cost far more--in the neighborhood of \$500 million capital.

3. MUNI METRO - 3rd St. (Bayshore) Corridor, San Francisco

The transportation element of the master plan for San Francisco recommends a 4-pronged rapid transit network radiating out from the City's CBD. Of these four proposed routes, one is operational, the BART Mission Corridor; one is under construction, the MUNI METRO Twin Peaks/Sunset Corridor; and one is under active study, the Northwest San Francisco rapid transit extension (NWX). The fourth recommended line traverses the Bayview Corridor paralleling 3rd Street and is not presently being studied.

This area of San Francisco exhibits great potential for future development. SF MUNI currently provides some express bus service in this corridor and the forthcoming MUNI Operations Planning Project presumably will determine if potential patronage warrants increased service. However, as a long range planning issue, express bus and eventually rapid rail transit service for this corridor must be studied in conjunction with overall development plans of the

City. A rough estimate of capital cost for a San Francisco facility would be \$200 million with a 5 mile line mostly at grade with 7 stations. An implicit operating cost of \$4.75 million per year is involved.

4. MUNI METRO Undergrounding - N Judah Line

The transportation element of San Francisco's master plan also recommends the undergrounding of the existing N-Judah Street car line from the Sunset Tunnel westward to the vicinity of 9th Avenue. This intervening area has been developed intensely with a corresponding increase in surface street congestion. The existing track alignment presents a slow and circuitous route for transit cars to follow.

Avoidance of this problem would lead to a decrease in transit time to and from the CBD. The question of whether or not this service improvement warrants a capital expenditure between \$90 and \$100 million should be addressed in the course of an analytical study.

5. Express Bus - Marina District to Downtown San Francisco

The travel corridor connecting San Francisco's CBD with the heavily populated northeastern sections of the city represents the only one for which the city's master plan does not recommend a rapid transit line.

SF MUNI currently offers some express services along the corridor, notably the 30X Stockton. However, the passage of the CBD-bound GGBHTD buses through the Marina presents a potential which should

at least be considered. Current policy prohibits passenger pickup and discharge within the city.

On a longer range basis, the possible diversion of GGBHTD buses to a transfer arrangement with the Geary Corridor subway also affects planning for transit access to northwestern San Francisco. Regardless of the outcome to these and other related matters, provision for express service from the Marina, Fisherman's Wharf, and North Beach into downtown must be assured.

6. Express Bus - Golden Gate Bridge Plaza-Richmond-Sunset-Daly City

This cross-town corridor lies along a north-south line passing through the Presidio, Richmond, Golden Gate Park, Sunset, and south to the county line near Daly City. Stops would include only primary east-west transit line transfers and major destinations along the route itself. Whereas SF MUNI currently provides local service along this corridor, a study of patronage potential would be needed to ascertain whether an express service is warranted at this time or in the future.

Regardless of the immediate need, long range planning must recognize this most crucial travel link. The potential extension of BART rail or county express bus service south into San Mateo

County from Daly City is a key factor. With the inauguration of such services, trips from the peninsula northbound for western sections of San Francisco and the Marin/Sonoma corridor would place substantial demand on this service. The reverse traffic flow from north to south exhibits similar potential. The avoidance of CBD congestion in San Francisco for these "through-corridor" trips necessitates implementing some variation of this transit service concept. We estimate the cost of 10-minute peak service on this route at \$720,000 (capital) and \$780,000 (annual operating).

7. Express Bus - Inner Cross-town Richmond to Bayshore, San Francisco

The corridor runs generally northwest to southeast, intersecting major travel corridors radiating west and south from the CBD through the Richmond/Western Addition, outer Market Street, the Mission, and Bayview/Hunters Point. In addition to providing a direct service between these major sub-centers of activity in San Francisco, this alignment would increase trip-making flexibility considerably on the CBD-oriented transit trunklines.

Various local service routes are maintained by SF MUNI within this corridor presently, and existing demand would require analysis to determine the need for immediate express routing. However, in the context of longer range objectives, this service represents a critical element in making the trunkline transit services now under study part of a complete transportation system. In order to provide a 15 minute peak hour service, an expenditure of

\$600,000 (capital) and \$650,000 (operating) would be required.

8. Express Bus - South Margin of San Francisco County

This corridor runs along an east-west alignment connecting Bayview/Hunters Point and Visitacion Valley to the outer Mission and Ingleside. Provision of service for this corridor could become crucial with the extension of trunk transit services south from Daly City. The likelihood of a corresponding shutdown of trunk line services currently passing through the Bayview District (S.P., Greyhound) from the south heightens the likely need for this service. Pending study analysis and a decision on related trunk transit studies, this corridor service represents a transit need which will probably not materialize for several years. Although the BART/MUNI Coordination Project examined this project and found it not of top priority, the forthcoming MUNI Operations Planning Project will supply added evaluation. We estimate the cost of providing 15 minute peak express bus headways at \$600,000 capital and \$650,000 annual operations.

9. Express Bus Route Extensions - Healdsburg & Sebastopol, Sonoma County

GGBHTD presently operates corridor bus service from San Francisco to one terminal in Santa Rosa, with off-freeway stops at intermediate points. Two major population areas not directly served by this corridor route remain in the county. Sebastopol lies 8 miles off the U.S. 101 corridor which GGBHTD follows into Santa Rosa. Buses presently stop at the freeway exit in Rohnert

Park leading to Sebastopol, but no routes travel into the city itself. Based upon a potential ridership remaining unserved by this arrangement, it would seem that the possibility of terminating one or more routes directly in Sebastopol warrants study.

Healdsburg is located along the U.S. 101 corridor approximately 15 miles north of Santa Rosa. A similar ridership potential and unserved needs situation exists here, suggesting an evaluation to determine the merits of extending service beyond Santa Rosa. With the implementation of these two service expansions by GGBHTD, all major population centers in the county would have trunk transit access to the greater Bay Area. Costs of these services are included in the overall expansion plans of the GGBHTD.

10. Express Bus - Transbay Trunk Transit

Three corridors are included in this issue: San Mateo-Hayward; East Palo Alto-Fremont; Richmond-San Rafael. The routing options for these services are constrained by existing bridge structures and access roads spanning the bay in each of these areas.

At the present time, only 2 out of 5 transbay transportation corridors offer both transit and motor vehicle access - the Golden Gate and San Francisco - Oakland corridors. The remaining three, listed above, have no public transit services. Transit service is being considered on the San Rafael/Richmond and Dumbarton Bridges and

is suggested on the San Mateo/Hayward Bridge by the San Mateo Local Bus Study.

Potential benefits from implementing additional transbay trunk transit are two-fold:

1. Each of the corridors directly connects urban centers significant in their own right. Large populations with corresponding trip generation and attraction are characteristic. The majority of these city-pairs have become interdependent based upon auto access.
2. The major regional trunk line transit systems, both existing and planned, have a distinctly north-south orientation in the Bay Area (due to topography and population). A significantly increased flexibility to meet alternative kinds of trip purposes could be incorporated into this trunk system with the provision of transbay routes in both the south and north bay regions. The obvious importance of this issue warrants special study effort to determine optimal system configuration and implementation scheduling.

11. Express Bus - Napa to Richmond and Concord via Vallejo

This corridor extends north from Richmond and the urban east bay across the Carquinez Strait through Vallejo and on into Napa City. Although the San Francisco-Sacramento Study addresses the concept of transit through Vallejo to the East Bay, a through-service

from Napa to Richmond via Vallejo does not seem to be contemplated by any study effort at the present time, although the Napa County segment should be examined in that county's Balanced Transportation Program. Ultimately this corridor will become one link in a north-bay transit loop into Sonoma and Marin Counties when travel demand warrants it. Express bus connections should also be considered between Napa and Concord (BART Station) via Vallejo and Martinez, in conjunction with BART's planned Concord-Martinez express bus route. This service could be provided at 15 minute peak headway at a cost of \$1 million capital and \$650,000 annual operating.

An express bus service along this corridor, interfacing with BARTD and AC Transit in Richmond, would provide wide area transit access for major urbanized portions of Napa and Southwestern Solano Counties. A study to determine the adequacy of existing public and private transit services provided in this area is a necessary first step in order to justify any subsequent investment in public transportation.

12. Express Bus - Danville-Dublin Connection

Existing plans for BARTD express bus service in the east bay envision one of the three routes in Contra Costa County extending south from BART-Walnut Creek to Danville, and another route in Alameda County extending east from BART-Bay Fair Station through Dublin into the Livermore Valley. The result is a missing transit link over a 10-mile stretch between Danville in the north and Dublin in the south.

The on-going BART extension study to Livermore/Pleasanton suggests that a substantial transit patronage potential exists for trips between the Livermore Valley urban centers and central Contra Costa County. With some further analysis, a minor adjustment in BART bus routing might be justifiable on the basis of additional transit trips along the San Ramon Valley Corridor. Four buses providing 20 minute peak headway service would cost \$400,000 (capital) and \$260,000 annual operating.

13. AMTRAK Station Transit Access

The increasing significance of rail transportation for inter-city trips over recent months poses the challenge of establishing convenient access to this mode from all parts of the region. The prime unresolved issue is how important passenger trains will become for inter-regional movements. For the Bay Area, a combination of coastal north-south service, trans-continental east-bound service, and a significant recreation travel demand for the eastbound service into the Sierra Nevada suggests that future use of AMTRAK service could be substantial.

Currently, AMTRAK maintains two terminals in the Bay Area - the central terminal is in West Oakland, with a peripheral stop in San Jose. The Oakland station is served by AC Transit for downtown Oakland and by AMTRAK buses to the Transbay Terminal in San Francisco. However, San Jose access is very limited and the Oakland terminal may need higher intensity service. Though both stations are centrally located, better access to regional trunkline transit

systems appears desirable. With extensive and modern trunk transit systems existing in the East Bay (BART and AC Transit), and a new transit system being formed in the South Bay, the possibility of interfacing inter-regional rail with regional/local transit should be studied and recommendations made. The range of solutions is wide, and costs vary accordingly; our estimates range from \$180,000 to \$5 million capital and zero to \$195,000 annual operating cost.

14. Bus Terminal Transit Access

The Region's primary bus terminals in Oakland and San Francisco have good access to public transit for the most part and in some cases, to regional trunkline services of BART and AC Transit. The real issue which has not received significant planning attention revolves around the concept of interfacing long-haul bus transportation service with the region's trunk transit services outside of the central urban areas. The possibility of providing convenient transfers for bus passengers onto a transit system which could then take them to the part of the region nearest their final destination merits study. Benefits might also accrue to private operators who would avoid the expense of downtown terminals and the congested traffic conditions which often degrade performance.

15. Airport Transit Access

This issue has been the most thoroughly addressed to date by transit planning studies. OATAP and SFAAP are two recently completed reports discussed earlier in the chapter which relate to trunk transit

service for Oakland International and San Francisco International Airports respectively. There is one existing municipal airport (San Jose) and one potential regional airport (Travis AFB) which merit planning consideration for some form of transit service. The Sacramento-San Francisco Corridor Study is reviewing the possibility of trunk-line services for Travis should it become a regional civilian airport. San Jose Municipal Airport has no special planning underway, however, this could be incorporated in the new transit system being formed in that area at the present time. Costs for additional airport transit access could be approximately \$1.3 million (capital) and \$850,000 operating annually, furnishing 13 new buses. San Jose Airport access is included in the Santa Clara County bus service expansion.

16. Other Recreational Transit Needs

Coastal San Mateo and Sonoma Counties are two areas of prime recreational use and potential not now served with public transit. Depending on the results of the Golden Gate Recreational Travel Study, similar transit improvements may be made here as well, although usage of the coast is not as intense as in Marin and San Francisco. The estimated cost of providing a low level of public transit access to these areas is \$350,000 for capital equipment (buses) plus the implicit operating cost.

17. Additional Local Service and Feeder Transit Needs

During 1973 MTC staff prepared a research paper on "Minimum Local Transit Service Needs". Part of this effort entailed

measuring the amount of local and feeder (as opposed to trunk) transit service being provided to the residents of each of the 290 zones into which the region is divided. Concurrently, the population characteristics for each area (mainly population density and low mobility groups) were examined. Based upon the latter data, standards were proposed for minimum local service. For example, in a very densely developed area, required transit service was figured at an eight minute headway during the peak hour over a route network with an average $3/8$ mile spacing. Lower standards were applied progressively to less dense areas, other times of day, etc. When the minimum needs for service were expressed as transit vehicle miles per zone they could be compared with actual service being supplied. The results showed that San Francisco meets hypothesized minimum service standards and provides at least a basic alternative to auto travel everywhere in the city, with a few minor exceptions. On the other hand, it was found that Santa Clara County would need to almost triple their present (mid 1973) transit service in order to meet minimum standards. It should be noted that this research did not include assessments of transit need regarding directionality or speed of travel.

Some of the current transit planning studies underway or awaiting implementation in the various Bay Area Counties will affect this assessment of additional need. However, there are certain areas where no progress is currently being made to upgrade service. These areas are as follows:

- Fairfield and Vacaville, Solano County: there is a significant need for local service where virtually none now exists. No transit district includes these areas.
- Livermore and Pleasanton, Alameda County. No local or feeder service is planned despite the coming of express bus service to BART or proposed rail extension. The area is included in the BART service district but BART does not provide local service.
- Pinole-Rodeo-Crockett-etc., Contra Costa County: added local service is needed to supplement the infrequent private service. MTC has been assisting in discussions with Pinole and local groups. These areas fall outside of the A-C Transit District but inside the BART District.
- Rohnert Park-Cotati-Sebastopol-Petaluma, etc., Sonoma County: these areas have demonstrable needs for local service and feeder service to GGBHTD trunk lines. However, GGBHTD will not provide service without a funding agreement from Sonoma County. A small local bus study is underway in Petaluma.
- Santa Clara County: needs a large increase in local service beyond that presently planned in order to meet minimum standards.

The following areas exhibit certain inadequacies in service levels but are progressing rapidly toward service increases. Since the situation may change radically in a short time it is difficult to pinpoint the exact extent of service needed to reach minimum standards.

- San Mateo County: pending interim municipal systems and ultimate countywide local bus system are being studied. Voter action on Transit District formation and funding is slated in the near future.
- Marin County: despite late 1973 cutbacks (20%) in local transit, the county is aggressively attempting to augment local service including a tax rate hike for the transit district in the June election.
- Sonoma County: Santa Rosa's transit improvement program has augmented service within the last year but is prevented by funding constraints common to all operators from meeting local transit service standards. This is also true of the City of Napa and the City of Vallejo which should have better local service than recently proposed.
- Contra Costa County: Central County areas show severe need for local service; LMTA studies promise short-term improvement. Local service improvements also are needed in Richmond, but may be alleviated by the forthcoming Dial-a-Bus system.

- Alameda County: Tri-Cities local transit planning is underway; some added local service is needed in the Hayward portion of A-C Transit District.

In total terms, it was estimated that 48,690,000 miles of local (mainly bus) service were provided annually in the Bay Area and that 13,625,000 added vehicle miles were needed to meet minimum standards. This service level would provide a basic alternative travel service to the private auto in all areas with net residential densities of 8 persons per net residential acre or greater. The county breakdown is shown in Table V-1.

Table V-1

Existing Local Transit Service & Needs to Meet Minimum Standards

<u>COUNTY</u>	<u>EXISTING SERVICE*</u>	<u>NEEDED ADD'L SERVICE</u>	<u>TOTAL</u>
Alameda	15.4	1.4	16.8
Contra Costa	1.9	1.8	3.7
Marin	1.8	.2	2.0
Napa	0.03	.6	.6
San Francisco	24.6	-0-	24.6
San Mateo	2.2	1.4	3.6
Santa Clara	2.2	5.8	8.0
Solano	.3	1.1	1.4
Sonoma	.2	1.1	1.3
TOTAL	48.6	13.4	62.0

*Annual vehicle miles in millions

The annual operating cost of providing minimum local transit service according to these standards can be estimated at \$17,712,000 based on \$1.30 per vehicle mile of service. Capital costs (outright purchase of vehicles) would be \$31,700,000

assuming each bus averages 43,000 miles of operation per year and that each bus costs \$100,000 including storage and maintenance facilities. Involved are 317 new local service buses providing the 13,625,000 annual service miles of operation cited above. Some pending actions by local operators, adding new service, will reduce the amount of new service needed to meet minimum standards, as service was originally measured in spring of 1973 and various improvements and commitments have been made since then.

Summary

Plans to extend and upgrade the region's transit system by a significant amount are prepared or are under preparation. The bulk of planned transit capital expenditures derive from rail rapid transit extension proposals which are very capital intensive. The greater availability of capital funding aid has in part given rise to this kind of proposal, whose operating costs (the crucial shortage) are theoretically minimized by the use of modern labor-saving technology. In terms of expenditures, estimated planned improvements would cost approximately \$7669 million in capital funds. These costs are more specifically broken down in the Table V-2.

Table V-2

Capital Cost Implications for Transit Improvement Proposals

Rapid Transit: Grade-separated Rail/Bus	\$7,330 million
Express Bus Services	51 million
Local Bus Services	182 million
Recreational Transit	1 million
Ferry System Extension	60 million
Transit Terminal Improvement	45 million
TOTAL:	\$7,669 million

The operating cost implications of these amounts are difficult to gauge since the per-mile operating costs increase into the future and cost estimates depend on when a particular service is instituted. Some operating cost estimates were provided earlier for each project assuming certain implementation dates, but since not all projects can possibly be implemented in one year, a cumulative total would be meaningless at this stage.

The capital cost estimates listed above are clearly astronomical when considered against the available funding resources and the previous ten years of transit investment. On the other hand, this amount is not as staggering in view of the amount of investment by the public and private sectors in automobile transportation.

Nevertheless, it is obvious that not all of the transit investment proposals can be initiated, let alone put into service, during the ten-year planning period. Chapter VI following will propose three different levels and combinations of transit investment based on funding sources available now and those which might be applied

in the future depending upon legislative changes detailed in Chapter VIII.

Chapter VI

TRANSIT DEVELOPMENT PLANS

A. INTRODUCTION TO ALTERNATIVES

In Chapters IV and V, we listed a number of transit improvement alternatives, some of which are now under active study, others of which are barely recognized as needs. The purpose of this chapter is to evaluate these proposals against MTC's goals and objectives contained in the Regional Transportation Plan, and combine alternatives into cohesive balanced improvement strategies. Before going further, however, we must point out that some transit expenditures are already committed into the future, namely the honoring of existing contracts for new capital equipment and the operation and maintenance of the current transit system.

Unfortunately public transit is hampered by a financial situation which discourages system improvement. Funds for capital equipment purchases are available in relatively substantial quantity, but operating funds are very scarce, having to be derived basically from local sources (property and sales taxes). In fact, this deficiency is severe enough that it can be projected with certainty that the region's transit agencies will be unable to continue operating their services at existing levels for the next ten years, unless

new funding sources are developed.

The mainstay of transit capital financing at present is the capital grant program of the Urban Mass Transportation Administration (UMTA). Using this federal money along with existing local "matching" funds (UMTA requires a local agency to pay for a fraction--usually 20%--of each capital project), the Region's transit operators can renovate and replace capital equipment so as to maintain the existing system at a level at least as high as we have now. Furthermore, the capability exists to purchase the equipment for transit expansion which is now committed by the Regional Transportation Plan or by prior action of the transit operators. However, existing funding will not allow the continued operation of the transit system through the next ten years, a problem most evident at present with the BART system but which will also reach crisis proportion with other transit operators before long unless new fund sources are developed.

One alternative transit development strategy would be to attempt to secure financing to underwrite the projected transit operating costs of the existing and committed system. The region would then enjoy a slightly improved transit system in terms of age of equipment. However, new service would be limited to the Golden Gate Ferry System, the BART Trans-bay tube, new Santa Clara bus service, and MUNI METRO

service on Market Street and in the Twin Peaks Tunnel. No expansion of transit service would be possible in any other parts of the Region. Although we cannot even pay for the operation of this system from our current funding sources, falling about \$460 million short by 1984, we do not recommend it as an alternate strategy because it is clearly inconsistent with the MTC Regional Transportation Plan and the objectives of local, state and federal governments. Such a strategy would be virtually that of a "do-nothing" alternative (unless it is conceivable that the transit system would be allowed to atrophy by 1984), not materially changing regional travel characteristics aside from the anticipated Trans-Bay BART service impact.

In determining optional transit investment strategies, we begin with consideration of the objectives and policies of MTC which are relevant to transit planning:

- Objective A: Transportation Programs shall consist of well-coordinated multi-modal systems to meet demonstrated travel demand which is consistent with policies of other regional agencies.
- Objective B: Transportation Programs will be designed to reduce over-dependence on the automobile as a transportation mode.
- Objective C: More efficient utilization of existing

transportation facilities shall be explored as an alternative to construction of new facilities.

-Objective D: Transportation Programs shall serve and reinforce other regional goals including land use, population, employment, urban development and environmental preservation.

-Objective E: Transportation Programs shall be designed to conserve energy resources insofar as this is consistent with the provision of necessary and adequate transportation service.

-Objective F: Transportation Programs shall be designed to maximize safety and high quality of facilities and systems using all economically and technically feasible means available.

-Objective G: Transportation Programs shall be designed to enhance the physical environment or to avoid or to minimize adverse impact on the physical environment.

-Objective H: Transportation Programs shall be designed to minimize social and economic disruptions to neighborhoods and communities in the region and to provide fair compensation and replacement of housing to those whose lives are disrupted.

-Objective I: Transportation Programs and Services shall be designed to meet the needs of all social groups with special emphasis on disadvantaged and low-mobility groups.

-Objective M: Transport Programs shall provide for the allocation of financial resources on a multi-modal basis according to the transportation priorities set by the Commission.

-Objective O: Transport Programs shall be efficiently operated and effectively coordinated within the region.

-Policy 1.1 MTC shall emphasize the development of public transit to provide a level of mobility within this mode that is more reasonably comparable to that afforded by the automobile.

-Policy 1.4 Major urbanized areas shall be served by frequently-scheduled trunk line transit service.

-Policy 1.5 Major transit service improvements shall be made within congested core areas of the region.

-Policy 1.6 Urbanized areas of the region shall have at least minimum levels of local and feeder transit service.

-Policy 1.7: Transit shall meet peak-hour travel demands to major activity centers, assuring reasonable

comfort and convenience.

-Policy 1.9 The speed, frequency and service efficiency of transit shall be increased to enable it to compete with the automobile as a feasible and attractive choice.

-Policy 1.10 Programs shall be developed to induce greater use of transit to meet peak-hour travel demands in major travel corridors including provision of convenient automobile and bicycle parking facilities at major transit stops, and assurance of adequate feeder transit service.

-Policy 1.11 Programs shall be developed to use transit to accommodate an increasing proportion of non-peak period and non-work related trips, including service to high-usage recreation areas.

-Policy 1.12 Pricing mechanisms and other economic incentives and traffic and parking restrictions shall be considered for appropriate application to reduce traffic congestion and improve access in major urban areas.

-Policy 1.18 Where a major transit need has been established, transit systems may be given precedence for use of portions of highway, street, and bridge right-of-way.

It is obvious that we cannot include a "do-nothing" transit improvement alternative and hope to achieve any progress toward the kind of transportation system sought by the above objectives. Our present funding predicament only shows how far we must go to begin to make transit an effective travel alternative to the private auto. Instead, we propose transit investments sufficient to insure a minimum level of local and feeder service in all urbanized areas of the region as a "Basic Transit Development Plan" alternative. Also included in this alternative are early-action transportation coordination programs: Intermodal, mainly transit preferential streets, and intramodal, programs of MTC's Transit Federation.

Two other transit improvement plan alternatives involving higher levels of investment are included in this Transit Development Program. These are the "Recommended Transit Development Plan" and the "Moderate Transit Development Plan".

The Recommended Plan represents a full development program which is designed to most completely meet the transit needs of the region within the next 10 years. The Recommended Plan, in addition to the elements contained in the Basic Plan, contains major additions to the local, feeder and trunkline bus systems which will provide transit service which approaches the levels envisioned in MTC's objectives and policies. The beginning of a large scale rapid transit expansion program is included with the Recommended Plan

to provide the region with a comprehensive high quality transit system in the long term. The Recommended Plan requires major new amounts of capital funding (particularly from the Federal government if 80% UMTA funding is assumed) and substantial additions of operating funds particularly beyond the 10 year period when new rapid transit facilities become operational.

The Moderate Transit Development Plan represents an intermediate level of transit development reflecting the availability of less than an optimum level of new financing. The primary difference between the Moderate and Recommended Plans is the degree of programming of rapid transit facilities. Moderate Plan reduces rapid transit commitments and associated capital costs considerably within the 10 year program period; however, this plan includes all elements of the Basic Plan and still proposes the major bus improvements of the Recommended Plan and their concomitant operating cost implications.

Within all three Plans the programming and priorities schedule established represents one of many possible combinations of programming. The question of determining which project actually begins, and when, will be the outgrowth of many variables related specifically to each project. Among the key variables which will determine implementation schedules are local institutional arrangements, status of

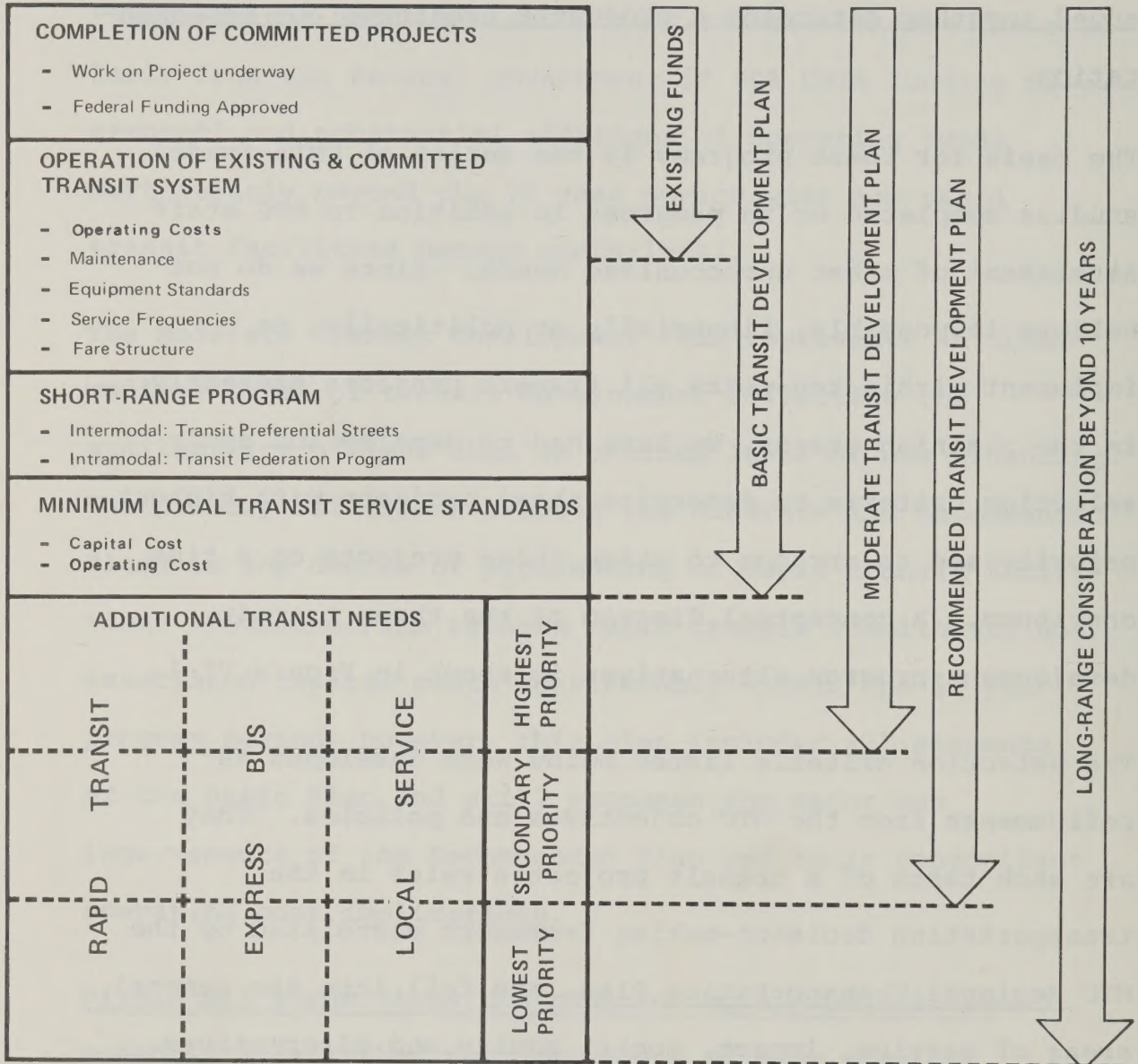
planning, local public support, environmental clearance, financial resources as well as many other factors which when added together determine a project's readiness for implementation.

The basis for these programs is the series of UMTA-funded studies completed or in progress in addition to MTC staff assessment of other unrecognized needs. Since we do not believe it possible, financially or politically, to implement within ten years all transit projects presently in the planning stages, we have had to develop and apply selection criteria to determine those projects with highest priority and to arrange to stage these projects on a time continuum. A conceptual diagram of the three transit development program alternatives is shown in Figure VI-1.

The selection criteria listed below were developed as refinements from the MTC objectives and policies. They are each tests of a transit project's value in the transportation decision-making framework postulated by the MTC Regional Transportation Plan, and fall into the general areas of service, impact, social equity and alternatives.

Figure VI-1

ALTERNATIVE TRANSIT DEVELOPMENT PLAN



TRANSIT PROJECT SELECTION CRITERIA

A. Service Characteristics

1. Patronage Potential
2. Speed of Operation
3. Capacity of System
4. Local Access Provided
5. Regional Access Provided
6. Ability to Serve Variety of Trip Purposes
7. Time Required to Implement

B. Impact Characteristics

1. Reduction in Automobile Congestion
2. Impact on Air Pollution
3. Impact on Noise Pollution
4. Esthetic Impact
5. Disruption Impact
6. Relationship to Planned Development

C. Social Equity Characteristics

1. Use of System by Low-Mobility Groups
2. Cost-Effectiveness

D. Alternatives to Project

1. Transit Alternatives
2. Highway Alternatives
3. Other Transportation Alternatives
4. Non-Transportation Alternatives

The defining of these criteria increases the specificity of MTC's objectives and policies. However, even if the technical ability to measure goal attainment was well-advanced, still lacking is a relative weighting of objectives and policies. This weighting is an especially critical need when, as is often the case, objectives conflict with each other. We nevertheless utilized the objectives, policies, and derived criteria to evaluate the relative priority of projects based upon a technical analysis.

We recognize, however, that several factors may significantly alter this initial evaluation of priorities. First, public, technical and Commission review may change project programming which can be incorporated as part of the annual updating process. Second, the degree of local institutional and financial support a project receives will influence its relative priority in the program. And third, many project evaluations must at this point be considered tentative since their planning studies are incomplete. The current lack of information in such cases is especially critical for rapid transit projects which, because of their operational inter-relatedness must be evaluated simultaneously in detail following completion of planning studies.

B. BASIC TRANSIT DEVELOPMENT PLAN

In order to achieve a basic improvement in the regional transit system by 1984, beyond doing nothing besides now-committed improvements, it is proposed that improvements be made and continued support be given to the following programs:

- Implement the transit improvement programs now committed through Federal grant action, etc.;
- Operate the current transit system at existing service levels, including the periodic replacement of capital equipment as it becomes worn and out-dated; also, operate committed transit improvements at planned service levels through 1984;
- Implement minimum levels of local and feeder transit service in all portions of the urbanized area;
- Implement short-term low-capital cost programs to coordinate transit systems with each other and to increase transit efficiency.

Each of these categories has operating and/or capital costs associated with it. Information submitted by existing public transit operators in keeping with MTC's transit aid requirements provides the basis for describing the first two categories and their related costs. MTC staff analysis of

the region-wide transit needs is the basis for the third and fourth program categories.

1. Completion of Committed Improvements

Chapter III summarizes 5-year transit Capital Improvement Programs (CIP) as forwarded to MTC by all operating agencies applying for transit aid for the Fiscal Year 1973-74. These programs do not distinguish between improvements which are committed for some reason and those which are simply proposed expenditures with no associated obligation. The basis for determining committed projects involves two principal factors:

- The status of project work or the contracts under which work will be done;
- The status of federal grant funding for pending project work.

Every effort should be made to complete on-going construction/acquisition programs if a substantial investment in time and money on the project work has already taken place. Further, should any binding contractual agreement have been finalized for work not yet underway, completion of that project must also be considered high priority. In either case, premature cessation of project implementation activities will result in unusable transit system elements as well as major financial and legal difficulties.

Given the potential availability of 80% capital funding from the Federal government, no local government or transit district will logically embark on an improvement program without grant approval. Some exceptions do exist with respect to low cost investment alternatives, but generally federal grants for a project proposal may be considered a critical factor in determining its commitment status.

Using these two factors as guides, an estimate of committed improvements as staged by the transit operators in their respective CIPS may be made.

SF MUNI

Completion of MUNI's three-part Capital Improvement Program (TEP, TIP, PIP) is described in Chapter III. Although amendments are presently being processed with respect to increasing costs associated with certain elements of these projects, they are not shown as being committed. Upon approval of Federal grant funding for these amendments and for additional improvements proposed by MUNI in a System Improvement Program (SIP), costs will be incorporated into the Basic Plan. Implementation activities will continue through FY 1977 based upon on-going construction/acquisition efforts and approved federal grant funding arrangements.

	(\$000)			
	<u>FY-75</u>	<u>FY-76</u>	<u>FY-77</u>	<u>3 Year Total</u>
TEP	\$17,940	\$15,945	\$4,493	\$38,378
TIP	14,875	7,187	-0-	22,062
PIP	<u>10,000</u>	<u>10,000</u>	<u>-0-</u>	<u>20,000</u>
	<u>\$42,815</u>	<u>\$33,132</u>	<u>\$4,493</u>	<u>\$80,440</u>

AC Transit

The continuation of AC Transit's bus replacement program as described in Chapter III is assumed. This program will continue through FY 1977, based upon on-going acquisition efforts and currently approved Federal grant funding arrangements.* A constant fleet size is assumed,** implying diversion of vehicles now in Trans-Bay service to improved East Bay service as full BART operations begin.

	(\$000)			
	<u>FY-75</u>	<u>FY-76</u>	<u>FY-77</u>	<u>3 Year Total</u>
Buses	\$2,118	\$4,014	\$ -0-	\$6,132
Support Facilities	<u>133</u>	<u>179</u>	<u>38</u>	<u>350</u>
	<u>\$2,251</u>	<u>\$4,193</u>	<u>\$ 38</u>	<u>\$6,482</u>

*AC Transit currently anticipates an accelerated equipment acquisition timetable involving 120 vehicles during FY '75.

**AC Transit's FY '75 TDA claim indicates an intended fleet expansion program of capital improvements approximating 5% per year.

BART

Committed elements include the completion of BART's 71-mile 34 station system, completion of the 4-mile MUNI METRO Market Street subway and its 4 independent stations, acquisition of 450 rapid transit BART cars, and activation of a 36-bus, four route express feeder service in Alameda and Contra Costa counties. An extraordinary capital commitment is also indicated by plans to transfer capital funds to operations in FY 75. Work on these projects will continue through FY 77 based upon on-going construction/acquisition programs and approved federal grant projects.

	(\$000)			
	<u>FY-75</u>	<u>FY-76</u>	<u>FY-77</u>	<u>3 Year Total</u>
Constr. Project Work	\$40,033	\$ 9,304	\$3,551	\$52,888
Rapid Transit Cars	38,274	17,184	-0-	55,458
Express Buses	2,518*	-0-	-0-	2,518
Misc. Cap. Conting.	4,180	1,350	288	5,818
Operations	<u>10,841</u>	<u>-0-</u>	<u>-0-</u>	<u>10,841</u>
	<u>\$95,846</u>	<u>\$27,838</u>	<u>\$3,839</u>	<u>\$127,523</u>

*Acquisition has been postponed to FY-75
and purchase will be made in the name of
AC Transit

Golden Gate Transit (GGBHTD)

Acquisition of 62 additional express buses and support facilities for the GGBHTD bus system during FY '75 is committed through a recently approved federal grant.

Improvements and expansion of GGBHTD's ferry system are also committed due to on-going equipment acquisition contracts and approved federal funding. However, both the cost estimates and staging associated with the ferry system improvements are in a state of flux. Information shown indicates MTC staff estimates of project staging with cost estimates originally approved for federal funding assistance.*

	(\$000)		
	<u>FY-75</u>	<u>FY-76</u>	<u>2 Year Total</u>
Bus System	\$ 3,503	-0-	\$ 3,503
Ferry System	<u>16,854</u>	<u>342</u>	<u>17,196</u>
	<u>\$20,357</u>	<u>\$342</u>	<u>\$20,699</u>

Santa Clara County Transit District (SCCTD)

Completion of SCCTD's initial 212 bus acquisition program** is scheduled over the next three years. Acquisition efforts through FY 1977 are indicated below including provision for support equipment and related facilities.

	(\$000)			
	<u>FY-75</u>	<u>FY-76</u>	<u>FY-77</u>	<u>3 Year Total</u>
Bus System	\$ 5,602	\$5,868	\$1,157	\$12,627

*GGBHTD's FY '75 claim includes updated estimates for capital expenditures on both the bus and ferry transit systems.

**This includes 78 new buses needed to replace older rolling stock now in service. Although not yet approved for federal grant assistance, these replacements reflect a commitment of the revised transportation program for Santa Clara County.

San Mateo County Municipal Operators

Transit improvement commitments have been made for the following bus acquisitions by cities in San Mateo County: Burlingame-4; Foster City-3; Menlo Park-6; Pacifica-6; San Carlos-4; San Mateo-9. Equipment will be phased into service over the next several fiscal years. Contingent upon the outcome of the pending transit district vote and the status of federal funding, expenditures in this county may vary markedly from the estimate stated here.

	(\$000)				
	<u>FY-75</u>	<u>FY-76</u>	<u>FY-77</u>	<u>FY-78</u>	<u>4 Year Total</u>
Bus Systems	\$83	\$104	\$60	\$198	\$445

North Bay Counties' Municipal Operators

The Cities of Napa, Vallejo, and Santa Rosa each have completed or are in the process of completing transit studies aimed at upgrading service. Vallejo and Santa Rosa have already purchased new equipment and additional capital expenditures will be minimal. Napa City is acquiring 4 buses over a four year period. These improvements are considered to be committed due mainly to their compliance with UMTA approved technical study results and the minimal cost implications associated therewith.

	(\$000)				4 Year
	<u>FY-75</u>	<u>FY-76</u>	<u>FY-77</u>	<u>FY-78</u>	<u>Total</u>
Napa	\$33	\$44	\$44	\$68	\$189
Vallejo	20	-0-	-0-	-0-	20
Santa Rosa	<u>71</u>	<u>11</u>	<u>11</u>	<u>11</u>	<u>104</u>
	<u>\$124</u>	<u>\$55</u>	<u>\$55</u>	<u>\$79</u>	<u>\$313</u>

On the basis of these committed transit improvements as they have been described for each public transit operator in the region, a committed capital improvement program may be estimated and its cost implications incorporated into the Basic Transit Development Plan. The following table summarizes capital costs for the first of four elements in the basic plan.

	(\$000)				4 Year
	<u>FY-75</u>	<u>FY-76</u>	<u>FY-77</u>	<u>FY-78</u>	<u>Total</u>
Committed Transit Improvement	\$167,078	\$71,532	\$9,642	\$277	\$248,529

NOTE: All numbers have been updated
in the FY '75 TDA Claims.

2. Operation and Maintenance of the Existing and Committed Transit System (E + C)

Those improvements which will almost certainly be completed during the next several years together with already existing transit operations and facilities constitute a core system of transit services for the Region. In order to remain consistent with the basic development plan concept as outlined previously, financial provision must be made to sustain this combination of old and new throughout the planning period.

It may be seen that continuation of the existing and committed transit system (E+C) requires both operations and capital financing in order to stabilize the overall level of service. Operations funding must increase over time in direct proportion to escalating labor, materials, energy, and other related cost factors or there will be an inevitable curtailment of services.

Capital funding is required for equipment and facility replacement. Equipment over time will become too old and facilities too run down to support the E+C System's level of service. Therefore a capital allowance must be included as part of maintaining the service status-quo. Although a definition of obsolescence in this case is highly subjective, factors such as maximum equipment age, facility safety/operational standards, and others must be taken into consideration when estimating this funding requirement.

On the basis of these guidelines, and using operator information as submitted to MTC, an estimate of E+C system operations and capital funding needs may be made. Table VI-1 indicates annual resource allocation by major operator and county municipal groups necessary to operate current levels of transit service through FY 1984. Consideration has been given to the cost implications of activating those project elements classified as committed. Four year

data (FY 75-78) indicates operator estimates made in 1973 whereas the balance of 10-year data are MTC extrapolations based upon the historical trend of an increasing operations cost for each respective system.

Table VI-2 shows the required additional capital elements of the F+C system. These costs vary in direct proportion to the age and physical status of each transit system's equipment and related facilities. Those systems which consist of all new capital elements (i.e. BART, GGBHTD) indicate no capital costs associated with maintenance of service, whereas systems with older fleets of rolling stock which have not yet been fully committed to replacement (i.e. SF MUNI, AC) show some capital cost allowance. Some equipment replacement costs are already committed and therefore have been included in the committed transit improvement capital figures.

The primary criterion for establishing these estimates is vehicle age. Those rubber-tired vehicles exceeding 15-years of age at any time during the 10-year period are assumed to have reached their maximum useful life and therefore are scheduled for replacement.* No major facility replacement investments are contemplated within the context of operational or safety considerations. All other costs associated with routine maintenance are incorporated in operating budgets.

*Several operators have indicated that 10-years represents a more realistic vehicle life.

Table VI-1

TOTAL OPERATING COSTS E + C TRANSIT SYSTEM

(\$ millions)

	FY 75	76	77	78	79	80	81	82	83	84	10-YEAR TOTAL
SF MUNI	58.55	61.70	65.01	68.53	72.40	76.61	81.71	86.20	91.67	97.26	759.64
AC TRAN.	30.35	32.62	34.94	38.43	41.73	45.32	49.22	53.40	58.02	62.93	446.96
BARTD	52.91	59.38	63.19	68.45	73.24	78.37	83.86	89.73	96.30	103.04	768.47
GGBHTD	13.10	15.53	16.92	17.96	19.31	20.76	22.32	23.96	25.78	27.72	203.36
SCCTD	7.42	9.06	10.40	10.84	11.92	13.11	14.42	15.86	17.45	19.20	129.68
SMC Municip.	1.21	1.29	1.36	1.42	1.54	1.67	1.81	1.96	2.13	2.32	16.71
N. BAY Municip.	.54	.57	.59	.60	.64	.68	.72	.77	.81	.87	6.79
REGIONAL TOTAL	164.08	180.15	192.41	206.23	220.78	236.52	254.06	271.88	292.16	313.34	2,331.61

NOTE: All numbers have been updated in the FY 1975 TDA Claims.

Table VI-2

UNCOMMITTED VEHICLE REPLACEMENT COSTS TO MAINTAIN E + C TRANSIT SYSTEM

(\$ millions)

	FY 75	76	77	78	79	80	81	82	83	84	10-YEAR TOTAL
SF MUNI*											
150 diesels @ \$60,00 ea.	4.80	4.20	-	-	-	-	-	-	-	-	9.00
135 trolleys @ \$50,00 ea.**	6.75	-	-	-	-	-	-	-	-	-	6.75
AC TRANSIT***											
377 diesels @ \$60,000 ea.	4.62	5.22	5.22	0.60	0.60	0.60	0.60	1.56	1.80	1.80	22.62
SMC Municipals											
6 diesels @ \$60,000 ea.	-	-	-	-	0.18	0.18	-	-	-	-	0.36
Capital Maintenance of E + C Systems	16.17	9.42	5.22	0.60	0.78	0.78	0.60	1.56	1.80	1.80	38.73

NOTE: No equipment replacement costs are programmed for GGBHTD, BART, SCCTD or North Bay Municipal Operators since none of their rolling stock will exceed 15 years of age within the planning period as a result of currently committed vehicle acquisition programs.

* The remainder of MUNI's fleet (motor coaches, trolley coaches, and streetcars) have already been replaced or are committed to be replaced. Cable cars, streetcars, BART cars and ferry vessels are exempt from the 15 year useful life definition.

** Estimated unit cost based on contract bidding is substantially higher than \$50,000.

*** AC Transit has formulated replacement estimates of their own in the FY '75 TDA Claim.

3. Short Term Transit Improvement Elements

The third element of this basic transit development strategy is the implementation of the short-term transit improvement programs described in Chapter IV of this report. All these programs should be initiated immediately and begin to show results within two years at most, although expenditures may be programmed over a ten-year period. The following programs are included:

a. Transit Preferential Streets Program-Surface Arterials

San Francisco's recent experience with this program shows an average cost of around \$17,000 per mile for improvements facilitating transit vehicle use such as dividers, islands, signing, striping, etc. This cost does not include added traffic enforcement which is often required.* We estimate transit preferential costs at \$20,000 per mile to allow more latitude of project design. The transit preferential mileage proposed for areas of the region is as follows:

(see chart next page)

*This cost is assumed to be borne by non-transit operating departments of local and state governments.

	<u>FY75</u>	<u>76</u>	<u>77</u>	<u>78</u>	<u>79</u>	<u>80-84</u>	<u>Total</u>
San Francisco	15	20	30	30	30	150	275
Oakland/Berkeley	10	20	20	20	20	100	190
Other East Bay	0	5	10	10	10	50	85
Marin	10	10	10	10	10	50	100
San Mateo	0	0	10	10	10	50	80
Santa Clara	10	15	20	10	20	100	185
TOTAL:	45	70	100	100	100	500	915
CAP'L COST (\$000)	900	1400	2000	2000	2000	10000	18300

b. Ramp Metering and Transit Preferential Freeway Lanes

We concur with the California Department of Transportation and the Traffic Coordinating Council in their plans to develop 56 miles of bus/carpool freeway lanes and 43 miles of freeway metered operation with transit-preferential access by 1976. We do not include cost estimates of these projects here, however, as the amounts are most properly allocable to the state and regional highway improvement program and are fundable within current legal and budgetary constraints.

c. Bus Shelter Program

A program of bus shelter construction and installment costing \$400,000 annually should be initiated, placing facilities at the transit boarding and transfer stops of highest passenger volume where at present no protection from cold, rain, sun, etc. is afforded. The estimated geographic breakdown of these costs is as follows:

<u>Location</u>	<u>Annual No. of Shelters</u>	<u>Annual Capital Cost in \$1000's</u>
San Francisco City & County	30	150
Alameda County	15	75
Contra Costa County	5	25
San Mateo County	5	25
Santa Clara County	15	75
Marin County	5	25
North Bay Counties	<u>5</u>	<u>25</u>
	\$80	\$400

The cost of bus shelters we estimate to average \$5,000 apiece. The construction program therefore amounts to annual cost of \$400,000 or \$4 million over ten years.

d. Fringe Parking

The following trunk transit parking areas for automobiles are proposed to be expanded, all within the next five years, by the number of spaces indicated. Future parking expansion after five years is contingent upon performance of the various transit trunklines and upon the effectiveness of proposed feeder transit service.

(see chart next page)

BART Stations:	Concord	390	
	Walnut Creek	375	
	El Cerrito del Norte	360	
	Fremont	360	
	Union City	480	
	South Hayward	400	
	Hayward	400	
	MacArthur	450	(including free-way ramp access)
BART Express			
Bus Stops:	Pinole	300	
	Pittsburg (Antioch)	250	
	Martinez	300	
	Danville	400	
GGBHTD Express			
Bus Stops:	Selected sites along Route 101 between Sausalito and Santa Rosa	535	(does not include parking at Larkspur Ferry Terminal)
TOTAL:		<u>5,000</u>	

At an average cost of \$1200 per parking space, this program will cost \$6 million over the next five years.* It is assumed that the expenditures will be made on a relatively uniform basis during this period. Provision for expanded Daly City BART Station parking and for BART express bus parking in Dublin (700 and 580 spaces respectively) is not shown due to their inclusion in the highway improvement program using Federal Aid Interstate funding sources.

e. Transit Advertising and Promotion

In order to implement the transit coordination programs cited in Chapter IV of this document we are allowing

*Recent operator estimates indicate total capital costs exceeding \$9 million for these improvements.

a budget of \$200,000 for the first year of MTC's Transit Federation activity. This will cover costs of high-priority transit information aids, public information services, and a beginning on a coordinated area-wide transit advertising and promotion program. Projected annual Transit Federation budgets are as follows:

1974-75	\$200,000
1975-76	\$300,000
1976-77	\$400,000
1977-78	\$500,000
1978-79	\$500,000
1979-80	\$500,000
1980-81	\$600,000
1981-82	\$700,000
1982-83	\$700,000
1983-84	<u>\$800,000</u>
TOTAL	\$5,300,000*

*Included in summary financing tables as a transit operating cost.

4. Minimum Service Levels: Local and Feeder Transit

The fourth element in this transit development strategy is the provision of minimum local and feeder transit service levels in all urbanized areas of the region in order to provide a transit alternative to the private auto. MTC staff research* has proposed service levels based on residential

*See MTC research paper: "Minimum Transit Service Levels".

density and the population characteristics of geographic areas (size of low-mobility groups, etc). Very low density areas could be served in some cases by a demand-responsive (Dial-a-ride) system, but this is not included here. Rather, figures were developed assuming the use of conventional transit equipment (full and medium size buses) operating on fixed routes. A demand-responsive system could be substituted in some low-density areas to provide the desired service level with lower capital vehicle costs but higher operations costs. For purposes of this estimate the cost differences are assumed to roughly cancel each other. This program element also constitutes a beginning of meeting travel needs of low-mobility groups such as the elderly, poor, etc.

The existing shortfall of service below proposed minimum standards can be eliminated through the provision of 317 buses. Already programmed as committed by the operating agencies is the imminent purchase of 175 buses which apply to service deficient areas, leaving 142 buses to be acquired in order to meet minimum service standards. Assuming a mix between bus types of 50% full-size and 50% medium-size, the capital cost total for this program is \$12.07 million. Costs per bus are \$100,000 per full size vehicle, \$70,000 per medium size vehicle, including in both cases an allowance for maintenance, storage, and other support facilities. The operating costs associated with the provision of this added

service are estimated on the basis of each bus traveling 50,000 miles annually, at a per-mile cost of \$1.30 in FY 75. This per-mile cost will increase annually as the result of inflation and other factors, at a rate of 7%. The FY 75 operating cost is therefore \$4.87 million, rising to \$17.93 million by FY 84. Over the 10 year period the added operating costs total \$129.8 million.

The staging of this transit improvement is proposed to be immediate following whatever bus vehicle acquisition plans are contained within the current contractual obligations of the transit operators. It is expected that the full minimum service standards can be attained by the end of five years.

A direct implication of this program is the need to establish institutional arrangements which can support provision of new local transit service in presently unserved areas. Possible means of achieving suitable arrangements are as follows:

- a. Alameda and Contra Costa Counties outside AC Transit District: service should be provided by AC either through annexation to District or by contract with BART or Municipality (ies). No new operating entity should be formed.
- b. San Mateo County: a county-wide general purpose transit district should be created,

absorbing all local public operators and providing the required new service.

- c. Sonoma County: should contract for local service with the Golden Gate Bridge, Highway, and Transportation District pending evaluation of countywide transit district.
- d. Solano County: should provide service on municipal basis pending evaluation of countywide transit district.
- e. Napa County: should be provided by contract with existing operators pending completion of Napa County Balanced Transportation Study.

5. Summary of Basic Transit Improvement Plan

Implementing the Basic Transit Development Plan will require an expenditure of \$328 million on capital improvements over the ten-year planning period. The majority of this money will be spent during the first three years, representing the completion of committed transit improvements such as the MUNI Market St. subway and the Golden Gate Ferry System. Beyond this point in time capital expenditures are relatively light, principally involving the periodic replacement of aging equipment and transit preferential street projects. Sources of capital funds are secure from local, state, and federal sources to cover the committed capital costs, and the remainder is

of a magnitude not to present great funding problems.

(See Figure VI-2 and Tables VI-3 and VI-4).

The unavoidable result of continuing the present transit system - not to mention expanding it - is a large operating cost which expands faster than do system revenues. The gap between operating costs and revenues is the so-called operating deficit, which will approximate \$461 million including tax support (cumulative) through FY 1984 assuming operation of the existing and committed systems. Adding the minimum local/feeder services and short-term transit improvement programs will add \$92 million to this cumulative operations deficit by FY-1984*. At the present time operating deficits are barely being met through local sales and property taxes, toll revenues, etc.

The final cost element which must be considered in the basic plan is debt service. Although this was not explicitly discussed in this Chapter, bond service obligations shown in Chapter III must be included as part of the minimum program to reflect previously incurred obligations. No funding problems are foreseen due to guaranteed tax and toll sources.

Table VI-3 shows the projected yearly cost of the Basic Transit Development Plan over the next decade by major

*Fare revenues should approximate one-third of total operating costs for expanded local service.

COST COMPONENTS OF BASIC TRANSIT DEVELOPMENT PLAN

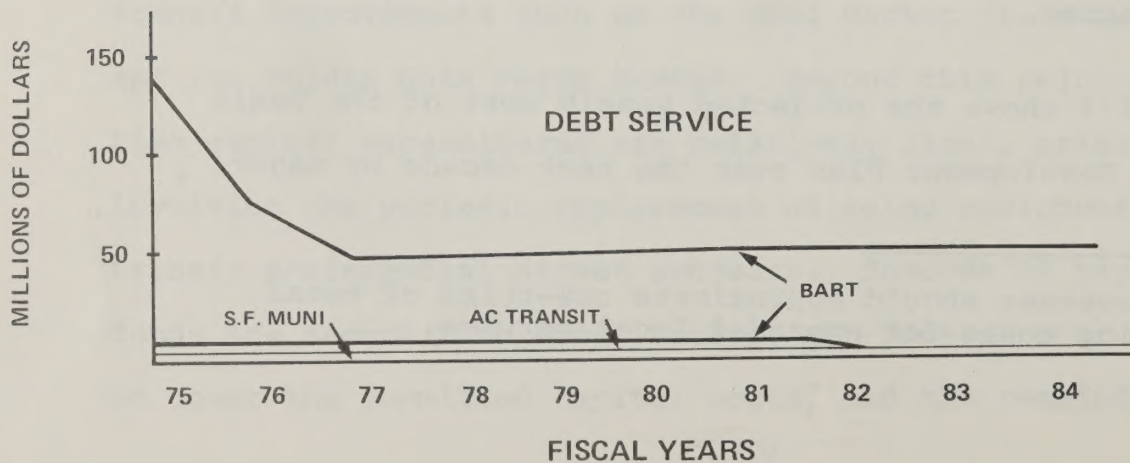
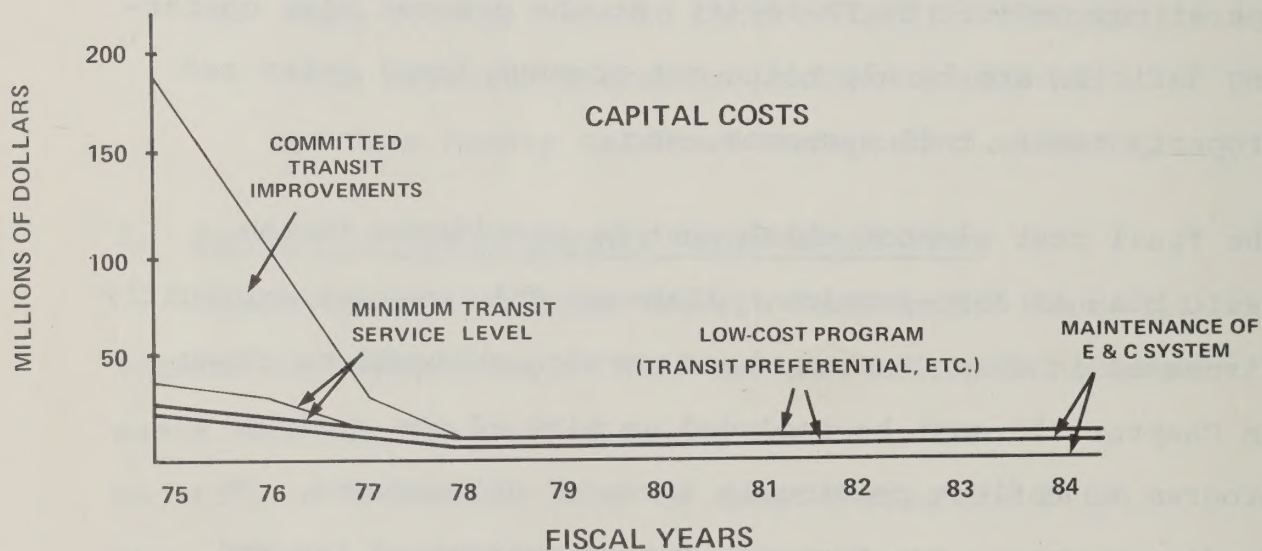
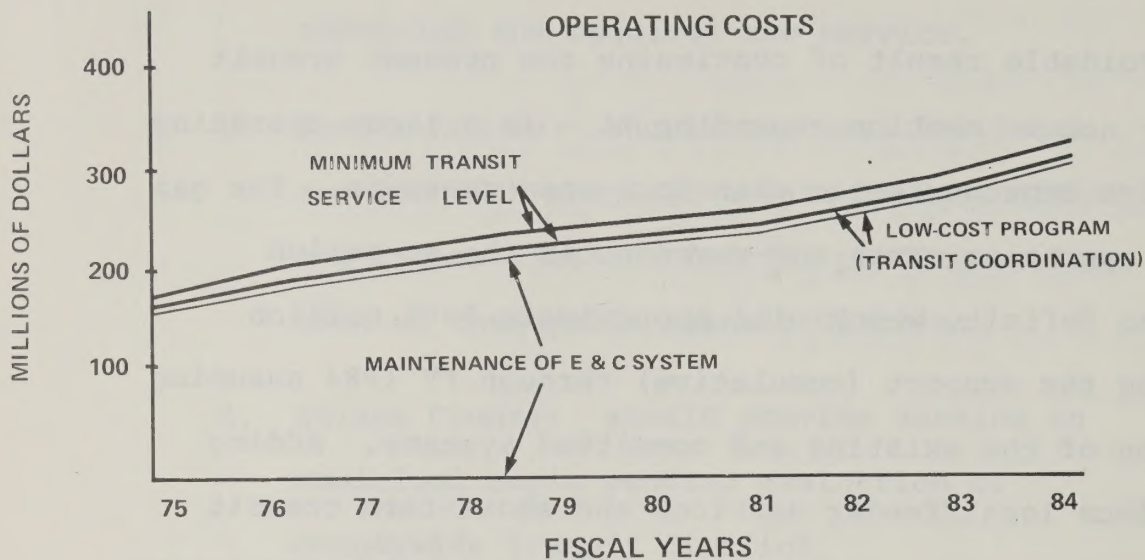


Table VI-3

BASIC TRANSIT DEVELOPMENT PLAN COSTS (\$000)

	FY 75	76	77	78	79	80	81	82	83	84	10-YEAR TOTAL
	<u>OPERATING COSTS</u>										
Maintenance of E + C	164,080	180,150	192,410	206,230	220,780	236,520	254,060	271,880	292,160	313,340	2,331,610
Short-Term Program	200	300	400	500	500	600	600	700	700	800	5,300
Minimum Service	4,869	10,465	11,193	11,921	12,740	13,650	14,651	15,652	16,744	17,927	129,812
Total Operations	169,149	190,915	204,003	218,651	234,020	250,770	269,311	288,232	309,604	332,067	2,466,722
	<u>CAPITAL COSTS</u>										
Committed Improvement	167,078	71,532	9,642	277	-	-	-	-	-	-	248,529
Maintenance of E + C	16,170	9,420	5,220	600	780	780	600	1,560	1,800	1,800	38,730
Short Term Program	2,500	3,000	3,600	3,600	3,600	2,400	2,400	2,400	2,400	2,400	28,300
Minimum Service	6,030	6,040	-	-	-	-	-	-	-	-	12,070
Total Capital	191,778	89,992	18,462	4,477	4,380	3,180	3,000	3,960	4,200	4,200	327,629
	<u>DEBT SERVICE</u>										
BARTD (incl Tube Bonds)	131,800	72,110	47,460	48,400	49,420	50,370	51,170	51,670	52,190	52,720	607,310
AC	1,160	1,160	1,170	1,290	1,410	1,530	1,620	-	-	-	9,340
SF MUNI (SFMRIC)	3,000	3,000	1,500	2,900	3,700	4,000	4,000	4,000	4,000	4,000	35,100
Total Debt Service	135,960	74,770	51,530	53,390	54,830	55,900	56,790	55,670	56,190	56,720	651,750
BASIC PLAN - TOTAL PROGRAM	496,887	355,677	273,995	276,518	293,320	309,850	329,101	347,862	369,994	392,987	3,446,101

Table VI-4

UNFUNDED COST ELEMENTS OF THE BASIC TRANSIT DEVELOPMENT PROGRAM

(Net of Existing Transit Financial Resources)

FY	75	76	77	78	79	80	81	82	83	84	10-YEAR TOTAL
<u>OPERATIONS</u>											
Maintenance of E + C	10.40	16.25	32.31	37.77	37.62	41.06	50.17	62.08	75.78	95.28	461.52
Short-Term Program	0.20	0.30	0.40	0.50	0.50	0.60	0.60	0.70	0.70	0.80	5.30
Minimum Service ¹	3.26	7.01	7.50	7.99	8.54	9.15	9.82	10.49	11.22	12.01	86.99
TOTAL OPERATIONS	13.86	23.56	40.21	46.26	46.66	50.81	60.59	73.27	90.50	108.09	553.81
<u>CAPITAL</u>											
Committed Improvements	-0-	-0-	-0-	-0-	-	-	-	-	-	-	-0-
Maintenance ³ of E + C	3.23	1.88	1.04	0.12	0.16	0.16	0.12	0.31	0.36	0.36	7.74
Short-Term ³ Service	1.25	1.50	1.80	1.80	1.80	1.20	1.20	1.20	1.20	1.20	14.15
Minimum Service ³	1.21	1.21	-	-	-	-	-	-	-	-	2.42
TOTAL CAPITAL	5.69	4.59	2.84	1.92	1.96	1.36	1.32	1.51	1.56	1.56	24.31
TOTAL PROGRAM ²	19.55	28.15	43.05	48.18	48.62	52.17	61.91	74.78	92.06	109.65	578.12

1. Assumes 33% coverage of operating costs from fare box revenues.
2. Indicates total new funding required, without specifying source (i.e. Federal vs. local).
3. Assumes continued 80% UMTA funding of all eligible capital projects.

expenditure category and these amounts are portrayed graphically in Figure VI-2. Figure VI-3 shows the total costs of the Basic Transit Development Plan and the operating and capital cost deficit mounting by 1984. Table VI-4 provides more detail on the unfunded* portions of all expenditures of this plan. Table VI-5 indicates equipment acquisition for the Basic Plan. Given some flexibility in utilizing funding resources and uncertainty as to what stipulations may govern future new revenue sources, it is not possible to estimate deficits on any single cost item. However, the aggregate deficit of around \$578 million cumulative through FY 1984 is relatively firm as a minimum figure and primarily attributable to operating costs.

*Estimates of available resources are tentative and will be further refined as Section IV of MTC's Regional Transportation Plan is updated. Interim assumptions are clearly indicated throughout this report.

Figure VI - 3

BASIC TRANSIT DEVELOPMENT PLAN COMBINED COST CHART

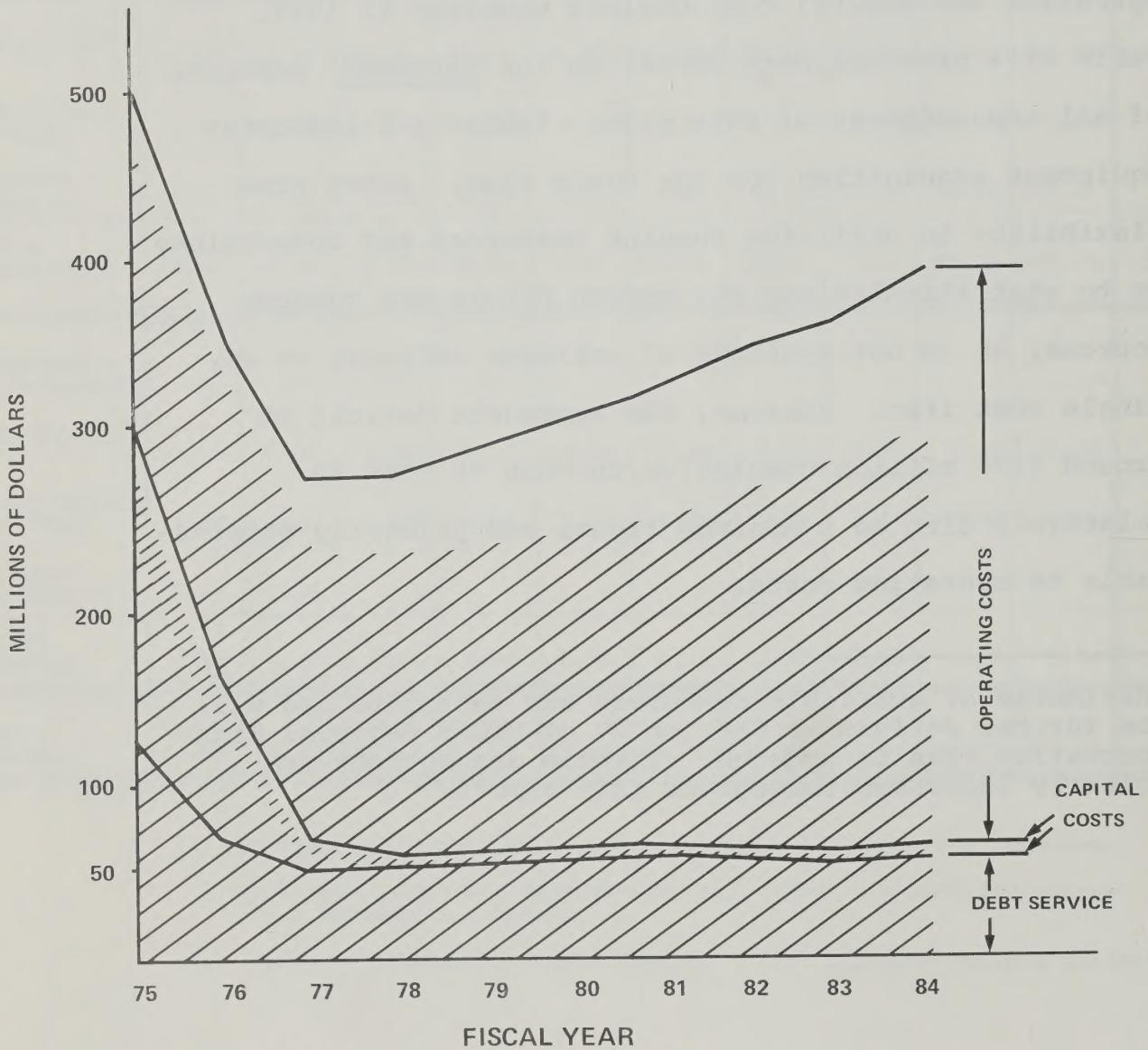


Table VI-5

BASIC TRANSIT DEVELOPMENT PLAN TEN-YEAR TRANSIT VEHICLE ACQUISITION

FISCAL YR.		75	76	77	78	79	80	81	82	83	84	10-YEAR TOTAL
COMMITTED IMPROV'TS												
SF MUNI AC TRANSIT BART* GGBHTD SCCTD San Mateo County (Munic.) North Bay Counties		45 ss 104 tr	35 ss 104 tr	20 mc								80 ss 20 mc 208 tr
		120 mc										120 mc
		100 rt 36 mc	50 rt									150 rt 36 mc
		32 mc 3 fv	30 mc									62 mc 3 fv
		134 mc	78 mc									212 mc
		20 mc	12 mc									32 mc
		1 mc	1 mc	1 mc	1 mc							4 mc
TOTAL		343 mc 104 tr	91 mc 104 tr	21 mc	1 mc							456 mc 208 tr
COMMITTED		45 ss 100 rt 3 fv	35 ss 50 rt									80 ss 150 rt 3 fv
MAINTENANCE E+C SYS.												
SF MUNI AC TRANSIT SAN MATEO CO.		80 mc 135 tr	70 mc									150 mc 135 tr
		77 mc	87 mc	87 mc	10 mc	10 mc	10 mc	10 mc	26 mc	30 mc	30 mc	377 mc
						3 mc	3 mc					6 mc
TOTAL		157 mc 135 tr	157 mc	87 mc	10 mc	13 mc	13 mc	10 mc	26 mc	30 mc	30 mc	533 mc 135 tr
MINIMUM TRANSIT SERVICE LEVELS		71 mc	71 mc									142 mc
TOTAL BASIC PLAN	mc	571	349	108	11	13	13	10	26	30	30	1161 mc
	tr	239	104									343 tr
	ss	45	35									80 ss
	rt	100	50									150 rt
	fv	03										03 fv

mc = Motor Coach
tr = Trolley Coach
ss = Subway/Surface (Muni-Metro) Cars
rt = Rapid Transit Cars
fv = Ferry Vessels

* This completes acquisition of BART's 450-car fleet. Additional rolling stock may be required to meet additional demands on BART's existing system in the future.

C. EVALUATION OF SUPPLEMENTAL TRANSIT IMPROVEMENT PROJECTS

All of the projects listed and analyzed below were mentioned in Chapter V as being either in some stage of planning or as having been recognized as needs. Although completed planning studies have for some projects provided very detailed information on project cost, impact, service characteristics, etc., many transit improvement projects are at best only partially studied. MTC also has the responsibility to assess transit improvement projects in a regional context, a consideration beyond the scope of the individual transit study. The evaluation of a transit planning project whose details - even in some cases as fundamental as mode selection - are not yet known, presents a serious problem. In most cases we have attempted to anticipate the likely recommendations of the study including cost estimates. This has proved impossible in certain cases, especially for the rapid transit studies. In those situations we have worked within the range of alternative solutions which at this point appear realistic for each rapid transit project in order to make a preliminary evaluation. However, we do not feel that the information currently available is adequate to determine overall project by project priorities. Accordingly, rapid transit program expenditures are not assigned to individual projects but rather are allocated to the program category of rapid transit. This Transit Development Program is intended to be updated annually to reflect project evaluation as the various

studies are completed, allowing MTC staff to make appropriate in-depth regional evaluations. It is anticipated that the technical studies for most rapid transit projects will be completed within the coming year. Accordingly, MTC staff will then prepare overall regional planning evaluations of these rapid transit projects to assist the Commission in the decision making process of establishing project-specific priorities programming for this transit element.

For ease of analysis we have grouped transit issues into categories of trunkline transit, local transit, express bus transit, recreational transit, transit terminals, and miscellaneous. All trunkline transit projects are considered separately while several of the less costly projects are evaluated jointly.

1. Trunkline Transit Issues - Preliminary Evaluations

a. Golden Gate Ferry System Expansion

The expansion of the ferry system to terminals north of Larkspur appears less desirable than investment in bus system expansion. For a comparable sum of capital, an intensive trunk bus system could be developed in Marin and Sonoma competitive in travel time with ferries assuming an exclusive lane operation on U.S. 101 or on a separate right-of-way. The advantage of ferries is the avoidance of socio-economic disruption associated with surface transpor-

tation facility construction, a major impact within San Francisco. Ferry projects generally involve, on the other hand, major environmental disturbances arising from terminal construction. The effectiveness of the ferry mode in serving long-distance trips is also compromised by routing inflexibility (small number of stops), the necessity for transfer of mode to reach the terminal, and the limited speed of operation. While ferry systems are capable of serving off-peak recreational trip purposes, including large tourist groups, the problems of terminal construction again limit flexibility. Finally, the cost of ferry system additions does not appear commensurate with the transit demands found elsewhere in the region. The 4-boat ferry fleet soon to be operative should constitute the only short-term investment in this mode. Eventual further expansion of the system should await a detailed evaluation of the impact of the new 4-boat ferry service to Larkspur and Sausalito.

b. Golden Gate Busway in Marin and San Francisco

The proposal to construct a separate right-of-way for the GGBHTD bus system, generally underground in San Francisco and on the surface in Marin, does not appear warranted in view of the expense involved, since there would be no realization of benefits to intra-San Francisco travellers. At the same time plans are also being developed for improvement of transit in the Northwest Corridor

of San Francisco (Geary Boulevard), one of the most heavily traveled transit corridors in the region. Separately, these projects could involve social, environmental, and economic disruptions that may be intolerable to the residents of San Francisco. A joint facility serving both functions may not provide the best service for both groups of patrons, but in the context of limited funding sources, it would be capable of serving transit demands at a far higher level than at present and could, given continued congestion and restraints on auto travel, effect the desired change in modal usage. A joint facility would also minimize socioeconomic and environmental disruption. The necessity of a transfer to the Geary line by passengers from the North Bay would be a disadvantage which could be minimized by frequent service on the Geary mainline. GGBHTD surface bus service to destinations not served by the joint Geary facility could be maintained. Before the rapid transit service is initiated in the Geary Corridor, GGBHTD buses should utilize a surface system of preferential routes during peak hours, possibly with a dispersed route system. Later, a transfer station on the Geary mainline would be built, probably at Park Presidio Boulevard. In Marin County a separate right-of-way for transit (the abandoned Northwestern Pacific R.R. lands) will probably not be needed in the near future to achieve a high level of Trans-bay service; the use of an extended peak-period lane

on U.S. 101 and on the Golden Gate Bridge reserved for buses and carpools would furnish this level of service at a far lower cost and reduce auto travel. The NWP right-of-way should be acquired, however, before this resource is lost or greatly inflated in price since it may be needed after 1984 for more intensive transit service. The provision of a grade-separated right-of-way in Marin including the subaqueous tube proposal does not appear consistent with Marin development objectives in the next decade.

c. Northwest San Francisco (Geary Blvd.) Rapid Transit

This project merits a high priority since it is capable of serving two major travel demands: the heavy intra-city Geary Boulevard traffic and transfer passengers from the North Bay. While significant social, economic and environmental impacts of construction can be expected, the limiting of below-grade construction to between downtown and a possible Golden Gate Transfer Station will reinforce the long-term development objectives of most of the neighborhoods concerned. Strong development controls will be needed to maintain the development character desired for the Inner Richmond District should the transfer terminal with GGBHTD be located at Park-Presidio Boulevard. The comfort, speed, and capacity of a MUNI METRO-type transit system would be consistent with the lack of alternative

travel means in the corridor, (highway facilities clearly ruled out) and in consideration of the large numbers of low-mobility residents. This project, like any rapid transit proposal, would require some time to implement, necessitating interim transit-preferential street improvements to effect an immediate improvement in the Geary Boulevard Corridor.

d. Third Street-Bayshore Transit Corridor

This major radial corridor in San Francisco unserved by rapid transit is a logical candidate for such service. Transit ridership potential is lower than for other corridors, and travel is less oriented to the San Francisco downtown. This corridor contains a large low-mobility population dependent on transit, a major sports complex, and industrial employment. The regional connection possibilities of the corridor are limited. However, junction to the Geary Boulevard rapid rail system would be feasible at the north but extension to the south in the near term is of limited value. With the dispersed nature of travel patterns in this area it appears more valuable to improve express bus service to the San Francisco downtown and to industrial areas in northern San Mateo County (including airport employment centers) during the 10 year planning period. This could be done utilizing transit preferential streets, along with improved intra-city transit connections from Hunter's Point, etc. to other neighborhoods. Finally, provision must be made for interface with the extensive local transit

service proposed to be developed in San Mateo County.

e. N-Line (Judah) Streetcar Undergrounding

The proposal to underground an added distance of this subway-streetcar line west of the Sunset Tunnel to 9th Avenue for \$90-100 million does not appear justified until alternative surface improvements are explored for avoiding conflict with automobile traffic. Compared to the cost of rapid transit extensions, the several minutes gained in travel time between the Sunset and downtown San Francisco is out of scale with the project cost at least during the next decade.

f. Rail Rapid Transit in San Mateo County

The extension of a BART compatible transit system into San Mateo County must be viewed as a top priority regional trunkline improvement during the next decade because it not only serves a highly-developed area which now has only limited trunk transit service, but also provides to the other counties improved access to far more travel destinations than any other proposed rapid transit extension. Of particular note is the access which would be provided to the San Francisco Airport, the Region's major air passenger facility and a significant employment center. As one of the region's major travel corridors heavily oriented to San Francisco, San Mateo County merits the high-capacity transit service which a rapid transit

system could provide. This project will be particularly beneficial in limiting auto commutation. While most of the areas the system would traverse are developed, there is potential for higher-density redevelopment which would have to be carefully controlled to conform to local land-use planning objectives.

This project is logically broken down into two segments, from Daly City to the Airport/Millbrae area; and from the Airport to the County line or more properly to Redwood City. The major transportation impact of this proposal will be on the peninsula commute service of the Southern Pacific Railway, whose duplicate service would be eliminated in different ways and in varying time frames depending on the completion of transit construction (see below).

g. Upgraded Southern Pacific Railway Commute Service

Renovating this privately-owned commuter rail service, now being studied by MTC staff, can take several general directions depending basically on the decision to extend rapid transit into San Mateo County. There is no question of the need to improve SP service to some extent, as it is the basic trunk service in an area heavily oriented to San Francisco for employment and other activities, and considering the long lead time for rapid transit construction. It is generally believed that if a decision to construct rapid transit only to the San Francisco Airport

during the next decade could be made, a moderate investment must be made in SP to enable it to continue its role as a trunk transit carrier for areas south of the Airport for at least fifteen years with express operation north of the Airport. On the other hand, if it is elected to build rapid transit in one stage to Redwood City, a lesser investment in SP is warranted since it will only need to continue its passenger role until the new service is opened in the mid-1980's. SP would then presumably abandon passenger service, the Santa Clara portion (Redwood City to San Jose) being replaced initially by an extensive express bus service to the Redwood City terminus. Longer-term trunk transit service may be provided either by further extension of rail rapid transit or the interfacing with Santa Clara County's proposed PRT system (Personal Rapid Transit).

h. Santa Clara County Rapid Transit Service - West Side

The construction of rapid transit from Redwood City to San Jose does not appear to be a likely candidate for implementation during the next decade because an extension to Redwood City from the north could barely be accomplished during ten years even under optimistic circumstances. Furthermore, rapid transit planning in Santa Clara County is not yet advanced to a stage where it is possible to select a BART-type mode over a possible Personal Rapid Transit (PRT) System for intra-county transit and the connection north-

ward to the regional trunk service. As mentioned earlier, a high-quality express bus service, possibly on reserved highway lanes, can be developed as an interim solution for trunk transit on the lower Peninsula during the coming decade.

i. Santa Clara County Rapid Transit Service - East Side

Connection of San Jose to the BART trunk transit system can be more immediately effected by means of an extension from BART's Fremont terminus in Alameda County. Next to the San Mateo extension of rapid transit, this project will provide the most improved regional access of all the extension possibilities. The potential for transit to shape development character of the adjacent territory in Alameda and Santa Clara Counties is significant as well since there is a large amount of undeveloped land in the project vicinity. The area at present contains both a sizeable number of employment centers and of low-mobility groups. This project represents the best means of linking San Jose and Santa Clara County to the East Bay and other Bay Area destinations. However, such a link could probably not handle major peak period travel demand between San Jose and San Francisco via the East Bay. A detailed feasibility study of this BART segment should be undertaken shortly.

j. Oakland Airport Transit Access

Recent transit studies on rapid transit access to

Oakland Airport have examined the alternatives of a direct BART loop to the Airport and an exclusive guideway shuttle between the BART Coliseum Station and the Airport. The shuttle could provide more frequent and satisfactory service at a lower cost and without adversely impacting service on other portions of the BART system while the higher cost BART loop alternative might give more satisfactory service for some but would also have the effect of reducing the frequency of BART service to other destinations.

The key factor in determining regional priority of a high capacity access to Oakland Airport is the growth of air travel patronage of this facility. In order to achieve a balanced regional airport system as recommended by the Regional Airports System Study (RASS), Oakland Airport will require the capability of handling 10-12 million annual passengers (a five-fold increase) by the end of the decade. Present ground access facilities fall short of this projected need and major expansion of auto access facilities to handle this demand is not likely. It will be transit's role to provide much of the needed access capacity. Therefore it is necessary, even before a high capacity transit link is constructed, to intensify and improve surface bus transit as an interim solution for Oakland Airport.

k. Livermore-Pleasanton BART Extension

The fact that this project represents a separate

BART operating line precludes serious consideration of staged construction, (i.e. opening a segment of the line one or two stations at a time). While there is a definite need for a travel alternative to the auto for residents of the Livermore Valley, the scale of service and expense represented by a BART extension may not be warranted in view of the present population and environmental conditions within the service area. An express bus service to Hayward about to be instituted is more appropriate, at least within the short run. Another factor favoring the delay of a decision to build BART is the uncertain development future of the Valley, which has been moving toward a slow-growth policy. The addition of BART to the development situation here will perhaps augment overall access and growth rather than simply diverting travel from autos - the prime source of the area's uniquely bad air quality situation. In any event, right-of-way should be reserved for transit (either bus or rail) within any proposed construction of I-580 through Dublin Canyon.

1. Pittsburg-Antioch BART Extension

This BART extension offers the possibility of fostering planned urban development consistent with local and regional policies and of serving a large group of low-income people. However, the population and potential transit patronage within the service area is small in comparison to the cost involved in the full extension.

Also, access to major trip destinations from the rest of the region is not enhanced appreciably. An interim express bus service to the BART Concord terminus, to be instituted shortly, should prove adequate to serving the outlying Contra Costa communities for the immediate future. This suggests the possibility of initially extending BART only to North Concord, providing improved rapid transit service in the direction of Pittsburg by a better and closer interconnection with California Route 4 and BART express bus service. Because the rapid transit proposal is a true extension of an existing BART operating line, incremental staged construction is possible.

m. San Francisco-Sacramento Corridor

The study of this corridor has not yet focused on well-defined alternatives but it nevertheless seems certain that no construction of a rapid rail transit system could be justified here unless unusual circumstances intervened such as a State decision to institute major inter-regional rail passenger service. Otherwise, the volume of travel projected in the corridor does not appear to warrant more than an upgraded express bus system, a service now being provided by the private sector. The major adjustments we could anticipate in this corridor's service during the next decade are better interchange of rail (AMTRAK) and bus (private operators) passengers with the public transit system in the region (issues which are discussed separately)

and better connection of Fairfield/Vacaville to BART service at Richmond and/or Concord.

n. Advance Right-of-Way Acquisition for Rapid Transit Projects

Although it may not appear possible given the financial climate, to undertake more than the most productive rapid transit extensions in the coming decade, the option to acquire land for future transit rights-of-way is desirable in view of the escalation in land costs and the tendency for development to encroach on now vacant land. Conventional land acquisition techniques dictate the purchase of vacant but seldom the developed parts of rights-of-way in advance of construction. We suggest purchase of entire rights-of-way and leaseback of developed properties to former owners to maintain the income-producing nature of the parcels. The areas where this land acquisition is necessary are in the following corridors:

- San Mateo County Rapid Transit R.O.W. at least as far south as the San Francisco Airport/Millbrae
- Northwestern Pacific Railway R.O.W. in Marin
- Pittsburg-Antioch BART extension R.O.W.
- Livermore-Pleasanton BART extension R.O.W.
- Fremont-San Jose BART extension R.O.W.
- Oakland Airport Access R.O.W.
- Rapid Transit R.O.W. within Santa Clara County

Construction on some of the above projects may not be begun

until late in the coming decade even under optimistic and ambitious funding assumptions. Advance right-of-way purchase is therefore a logical priority. A major issue to be resolved is whether federal grants may be used for purchasing rights-of-way far in advance of actual transit system construction.

2. Express Bus Systems

a. Trans-Bay Express Bus System

Little or no alternative travel option to the auto now exists to cross San Francisco Bay between Richmond and San Rafael, San Mateo and Hayward, and Palo Alto and Fremont although substantial resources have been and will be devoted to providing auto access in these corridors. Recent travel data indicates substantial growth of traffic (especially including movement of Alameda residents to San Mateo County jobs) in these corridors to the point where a regularly scheduled public transit service is needed. The services are difficult to implement since they all span transit district jurisdictions, and at worst, extend into areas without a transit district. Some new transbay transit service will be contingent on transit district formation in San Mateo County while other services deserve a high priority for inter-agency negotiation between BART, AC Transit, GGBHTD, and SCCTD.

b. Intra-San Francisco Express Bus Services

Continued improvement appears warranted in MUNI

non-radial cross-town express bus service in the city, utilizing transit preferential streets where feasible. At present such service is infrequent, slow, and follows circuitous routings, and does not adequately serve important city destinations such as San Francisco State University, City College of San Francisco, Golden Gate Park, industrial sites along the Bay, etc., and inadequately connects residential districts, such as the Richmond to the Mission District. However, rapid transit is not warranted by the travel demand, let alone the cost and disruption of extensive construction. Instead, express bus services merit short-range improvement.

Added express bus service will be called for during the coming 10-years to improve access to the Marina District, between the Golden Gate Bridge and Daly City, along the southern margin of San Francisco County, through the inner cross-town corridor, and along the 3rd Street corridor.

c. Golden Gate Corridor Bus System Expansion

The trunk bus system carrying North Bay passengers to San Francisco has exceeded operational capacity and the fleet size needs to be increased to reflect growing ridership as well as greater coverage of Marin and Sonoma localities by branching of routes from U.S. 101. This need is immediate; vehicle acquisition should be begun and staged over the ten-year period.

d. Napa-Vallejo-Richmond (and Martinez) Express Bus Service

The increasing development of the North Bay Counties as residential areas and to some extent as centers of commerce and industry warrant a degree of regional transit connection to the south. The most effective short-term means of accomplishing this linkage is through bus service from Napa passing through Vallejo and on to Richmond (BART terminus) and to Martinez (interconnection with BART express buses to Concord). This service will relate very well with local transit service development in Napa, Vallejo, and in the central and eastern portions of Contra Costa County.

e. Danville-Dublin Express Bus Service

A transit connection between the San Ramon and Livermore Valleys would complete a network of inter-city linkages in the East Bay Counties. This need will grow as development increases in the Interstate 680 corridor. The BART express buses programmed for early implementation accommodate most of the long-haul transit needs but this final link should be provided sometime during the coming decade.

f. Alameda-McArthur Express Bus Service

Although the City of Alameda and the McArthur Corridor in Oakland receive a high level of bus transit service from the AC District, they are still the most populated areas of Alameda County most distant from BART service and

might merit better express connection to BART stations when Trans-Bay BART operations begin and transit patronage grows. A suggested routing is from Alameda via the downtown Oakland BART stations, the MacArthur BART Station, and down MacArthur Boulevard to East Oakland. This route could be operated at high service levels utilizing equipment removed from Trans-Bay service when BART commences full operations.

3. Local Bus Service

The following service increases in local and feeder transit service are additions beyond the meeting of minimum service levels. Minimum service levels are calculated on the basis of existing travel patterns, development and population. As development, population and travel needs change, transit needs - especially for local service - will increase.

a. Santa Clara County

Augmentation of committed levels of local transit service in Santa Clara County will be needed over the next decade. Surface transit vehicles will not only have to meet increasing demands for local service but also will have to serve a trunk express function to connect to San Mateo and Alameda Counties in advance of constructing rapid transit projects or before a proposed Personal Rapid Transit (PRT) system could begin to serve intra-county travel.

b. San Mateo County

As in Santa Clara County, San Mateo will require greatly increased local bus service which will have to serve a feeder function to long-haul Transit such as an upgraded Southern Pacific and eventually the extension of rapid transit. Plans being developed in San Mateo for a 220 vehicle bus fleet will be able to meet the mobility needs of the County, providing a level of service now afforded by AC Transit in the East Bay.

c. North Bay Counties

Further development of local bus service in Sonoma, Solano, and Napa counties is warranted during the next ten years to build a better transit system than represented by meeting needs described in the Basic Transit Improvement Plan Alternative. One of the most rapidly growing areas of the region, the North Bay should not remain entirely dependent on the automobile for its travel needs.

d. Marin County

A continued program of local transit development should be undertaken in Marin to meet goals of limiting highway needs and auto dependency. Service should be provided extensively throughout the eastern urbanized portions of the County in accordance with urban development plans.

e. San Francisco

Progressive upgrading of the MUNI local transit system will be required during the next ten years beyond present commitments and transit preferential street plans. New capital costs for this - the most heavily used transit system in the region - include rolling stock additions as well as improvements to ways and structures. These proposals are described in amendments to MUNI's Transit Equipment and Transit Improvement programs, and in an all-new System Improvement Program (SIP). Approximately \$80 million in recommended capital improvements in addition to those now committed for implementation are included, pushing MUNI's total improvement program over \$205 million. Much of this expenditure should be programmed relatively soon to complement the forthcoming findings of the MUNI Operations and Planning Study.

f. Contra Costa County

Local transit service in two areas of Contra Costa County will require augmented local transit service within the next decade (above minimum service levels): the Central County Area - Concord, Walnut Creek, et al.; and the Northwest County-Pinole, Crockett, Rodeo, etc. Improved transit service within the present area of Contra Costa County now served by AC Transit could be provided through application of buses and equipment formerly devoted to Trans-Bay operations.

g. Alameda County

As in Contra Costa County, the AC Transit District will benefit from vehicles diverted from Trans-Bay operation after BART initiates full service. Additional service needs beyond minimum levels are proposed for Livermore-Pleasanton and the Tri-Cities areas.

4. Recreational Transit

The financial and physical dimensions of providing transit for this purpose is not yet well-defined although the traffic problem is quite noticeable. It is presumed that major service improvements can be made borrowing transit rolling stock not utilized when recreational travel is high - thus avoiding some capital costs. Difficult terrain may, however, dictate capital expenditures on unique equipment. Capital costs will most likely be more significant for fringe parking related support facilities. Operating costs, however, present the largest financial burden of new transit service to recreational sites. The most critical part of the region where recreational transit is needed is Marin County because of the newly-formed Golden Gate National Recreation Area. Sonoma and San Mateo's coastal areas and the Northern Napa Valley face similar problems as well, though slightly farther ahead in time. The problem is how to provide access to a growing number of recreationists without despoiling the natural beauty which lures the traveler in the first place.

5. Transit Terminal Improvements

The major transit terminal issue in the region is the future of the Transbay Terminal in San Francisco. We support plans to retain this valuably-located facility as part of the regional transit system after BART's full system is operational. This is essential in order to handle remaining AC Transit lines, GGBHTD lines, express bus service to the Peninsula (such as via 3rd St. Corridor or via freeway to the Bay and Coast), and privately operated bus service. Much of the cost of terminal redesign to handle the different kinds of transit traffic could ultimately be paid for by leasing air rights for commercial development on this site which enjoys excellent transit as well as auto access. Development of the terminal may not be an extremely urgent matter, as the initial loss of many AC runs will allow greater capacity for other operators and obviate immediate needs for redesign; however, in the longer-term, a significantly expanded facility is seen as necessary to provide a central terminal for public and private bus operations into San Francisco's CBD.

A second terminal issue is the possibility of improving the interface between interstate and interregional bus and rail systems with the inter-regional trunk transit systems such as BART. The development of transfer-to-BART options via mini-terminals at Bayfair, Richmond or West Oakland would

enhance the service provided by AMTRAK. In lieu of firm projections of AMTRAK investment and patronage, however, it is difficult to place a high priority on the project.

6. Miscellaneous

The major high-priority project of all other transit needs not discussed above is the provision of increased levels of service to low-mobility groups for a variety of trip purposes including social, recreational, medical, educational and employment trips. Unique services are likely to be needed to reach target low-mobility groups, such as demand-responsive systems. To some extent in the past these transportation costs have been incorporated in the budgets of various social service agencies. In the future it can be anticipated that the cost of augmented transit for special groups will become increasingly a part of the public transportation sector's responsibility.

The other major transit system alteration is the coordination of AC and MUNI surface operations with BART, especially with the inauguration of Trans-Bay Service. As mentioned earlier, it is assumed that AC will maintain those trans-Bay routes which retain a travel time advantage over use of BART. These routes will continue operation from the Transbay Terminal at present or reduced headway. Equipment freed from superfluous Trans-Bay bus service should be applied to augment local and feeder-to-BART service in AC

Transit's East Bay service area. Consequently no capital cost is involved beyond periodic replacement of aged equipment, but a continued high operations cost will accumulate.

D. MODERATE TRANSIT DEVELOPMENT PLAN

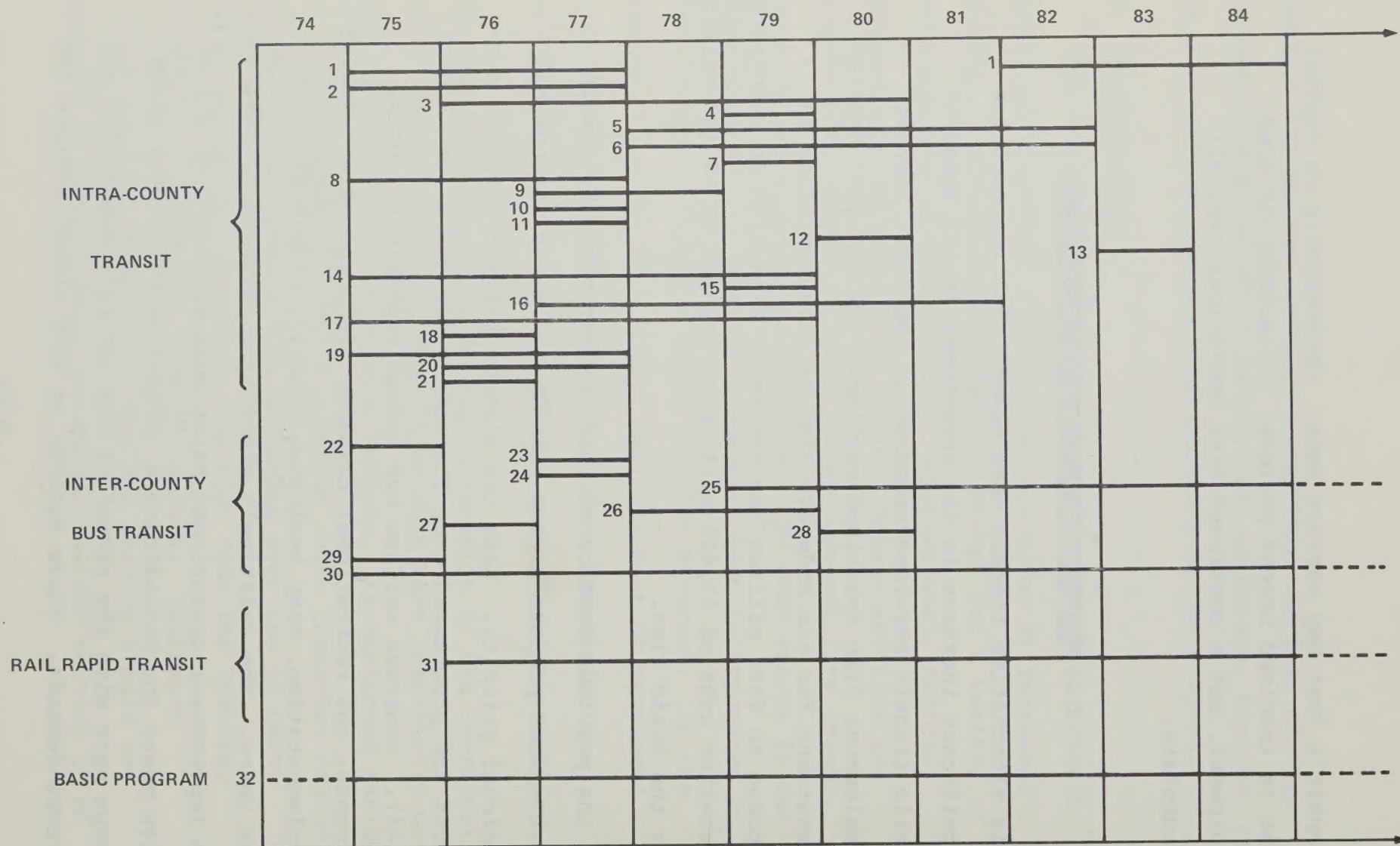
This alternative transit development plan represents a significant increase in the investment in all types of public transit services compared to the Basic Transit Development Plan described earlier. The ten-year capital investment for the Moderate Plan is \$1,289 million as opposed to \$328 million for the Basic Plan with an associated operating cost of \$3,451 million as opposed to \$2,467 million for the Basic Plan.

In the previous section of this chapter various transit development proposals were briefly evaluated for overall regional priority. Here the highest priority transit projects are programmed over the coming ten years (see Figure VI-4). Numerous surface bus system expansions (local, express, and recreational transit) are proposed for gradual implementation, many beginning shortly, within the next ten years. The relatively short time required to make such an improvement operational makes such proposals an attractive means for maintaining a transit service level which keeps pace with the growth of the region's population and travel demands. These systems to some extent achieve the

Figure VI - 4

STAGING OF 10-YR. CAPITAL IMPROVEMENT PROGRAM - MODERATE PLAN

FISCAL YEARS



NOTE: See key on following page for project description

Key to Figure VI-4
Moderate Plan

PROJECTS INCLUDED IN 10-YEAR CAPITAL IMPROVEMENT PROGRAM - MODERATE LEVEL

Description	Implementation Staging	Capital Cost FY 1975-84 \$ millions
1. Marin Co. Local Bus Transit	75-77; 82-84	15.00
2. Marin Co. Recreational Transit	75-77	0.75
3. Sonoma Co. Local Bus Transit	76-80	3.80
4. Sonoma Co. Recreational Transit	79	0.10
5. Solano County Local Bus Transit	78-82	3.80
6. Napa Co. Local Bus Transit	78-82	1.70
7. Napa Co. Recreational Bus Transit	79	0.10
8. SF MUNI Transit Improvements (S.I.P.)	75-77	68.00
9. MUNI Express Bus Service Marina to CBD	77-78	1.50
10. MUNI Express Bus Service GGB to Daly City	77	0.72
11. MUNI Express Bus Service Third St. Corridor	77	0.72
12. MUNI Express Bus Service Inner Cross Town	80	0.60
13. MUNI Express Bus Service South County Margin	83	0.60
14. San Mateo County Local bus Transit	75-79	17.00*
15. San Mateo County Recreational Transit	79	0.25
16. Santa Clara County Local Bus Transit	77-81	22.95
17. Central Contra Costa County Local Bus Transit	75-79	10.00
18. N.W. Contra Costa County Local Bus Transit	76	0.03
19. Tri-Cities Local Bus Transit	75-77	3.80
20. Livermore/Pleasanton Local Bus Transit	76-77	0.85
21. Berkeley Coordinated Bus Improvements	76	1.05
SUB-TOTAL: Intra-County		153.32
22. Richmond-San Rafael Express Bus	75	0.40
23. San Mateo-Hayward Express Bus	77	0.50
24. Fremont-Palo Alto Express Bus	77	0.50
25. GGBHTD Corridor Bus Expansion	79-84 continued	10.00
26. Napa-Vallejo-Richmond Express Bus	78-79	1.00
27. San Ramon Valley Express Bus	76	0.40
28. SFO-SFCBD Express Bus	80	1.00
29. Oakland Airport-Coliseum Bus Shuttle	75	0.30
30. Special Transit Needs	75-84 continued	4.16
SUB-TOTAL Inter-County		18.26
31. Rapid Transit (Undetermined Project Selection)	76-84 continued	790.00
32. Basic Plan Capital Improvements	75-84	327.63
TOTAL MODERATE CAPITAL PROGRAM		1,289.21

* Recent consultant estimates place capital cost at \$27 million.

objective of accommodating a greater share of regional travel on the public transit system.

Most of the projects chosen in this alternative represent facility and equipment acquisition programs that are compatible with or adaptable to more extensive capital improvement programs which might be developed in the future. The bulk (though not the major portion of capital expenditure) of these proposals are bus facilities and equipment which would ultimately be required to support and complement fixed guideway facilities in one of the following ways:

- Some of these bus facilities and equipment can serve as interim solutions in corridors in which a long construction period would be required before fixed guideway rapid transit systems could begin to provide service.
- Some of these bus facilities and equipment would likely be continued after institution of rapid transit service as needed local/feeder and complementary trunk bus service.
- Even when bus services are supplanted by rapid transit those vehicles and facilities which have not reached the end of their useful life can be utilized for bus services in other corridors.

Those capital intensive rapid transit proposals programmed for initial funding in this alternative should be those which provide the most beneficial transit service, based upon the evaluation of the individual planning studies when all are completed. While final evaluation of study results will determine the specific selection of rapid transit projects to be implemented in this Moderate Plan, at this point we only propose a general level of investment in rapid transit during the coming 10 years. The program elements selected for the Moderate Plan are intended to most adequately serve the transit objectives of the Regional Transportation Plan within the constraints of the level of financing proposed.

The addition of the transit elements which can be put into service rather quickly does not result in tremendous capital cost increases above the expense of the Basic Plan. It is instead the grade-separated rapid transit extension projects which would require vast sums of money. As was pointed out at the end of Chapter V, plans exist or will shortly be prepared for rapid transit investments totaling over \$7 billion. Since this Plan involves adding less than \$1 billion in capital costs to transform the "Basic" to the "Moderate" Transit Development Plan, it is obvious that some critical limiting decisions must eventually be made in the area of rapid transit expansion.

The transit improvements selected for inclusion in the Moderate Transit Development Plan are listed in Table VI-6 and are shown on a staged basis in Figure VI-4.

The capital costs of the moderate plan are primarily from unspecified rapid rail transit proposals. The operating costs over the ten year period are primarily attributable to surface bus operations since very little new rapid transit service will be operational by 1984. Operating costs on an annual basis for each transit project are shown in Table VI-7, for the Moderate Plan amounting to \$3,451 million over the decade. Figure VI-5 indicates the comparative costs, on a staged basis, between the Basic and Moderate Transit Development Plan Alternatives, revealing the major difference to be in the capital expenditure area.

Table VI-9 gives the grand total cost for the Moderate Plan of \$5,392 million (assuming no further bonded indebtedness than at present) as opposed to the Basic Plan's total cost of \$3,446 million.

The ability of current resources to meet the costs of the Moderate Transit Development Plan is shown graphically in Figure VI-6; detailed amounts are given in Table VI-9. The unfunded operating costs are double that of the Basic Plan, while capital costs increase by a factor of nine for a grand total of \$1409 million in new funding required. The total unfunded requirement for the Basic Plan was \$578 million.

Table VI-6

MODERATE TRANSIT DEVELOPMENT PLAN TEN YEAR CAPITAL PROGRAMMING SCHEDULE

(in millions of dollars)

Fiscal Year	75	76	77	78	79	80	81	82	83	84	10-YEAR TOTAL
Marin Local ¹	2.50	2.50	2.50	-	-	-	-	2.50	2.50	2.50	15.00
Marin Recreation ²	0.25	0.25	0.25	-	-	-	-	-	-	-	0.75
Sonoma Local	-	0.76	0.76	0.76	0.76	0.76	-	-	-	-	3.80
Sonoma Recreation	-	-	-	-	0.10	-	-	-	-	-	0.10
Solano Local	-	-	-	0.76	0.76	0.76	0.76	0.76	-	-	3.80
Napa Local	-	-	-	0.34	0.34	0.34	0.34	0.34	-	-	1.70
Napa Recreation	-	-	-	-	0.10	-	-	-	-	-	0.10
MUNI Imprv. ³	15.00	30.00	23.00	-	-	-	-	-	-	-	68.00
MUNI Express	-	-	2.19	0.75	-	0.60	-	-	0.60	-	4.14
SMC Local	3.40	3.40	3.40	3.40	3.40	-	-	-	-	-	17.00
SMC Recreation	-	-	-	-	0.25	-	-	-	-	-	0.25
SCC Local	-	-	4.59	4.59	4.59	4.59	4.59	-	-	-	22.95
Central Con. Cos. Local	2.00	2.00	2.00	2.00	2.00	-	-	-	-	-	10.00
N.W. Con. Cos. Local	-	0.03	-	-	-	-	-	-	-	-	0.03
Tri-Cities Local	1.26	1.27	1.27	-	-	-	-	-	-	-	3.80
Livermore/Pleas. Local	-	0.42	0.43	-	-	-	-	-	-	-	0.85
Berkeley Local	-	1.05	-	-	-	-	-	-	-	-	1.05
SUB TOTAL Intra-County Transit Capital Cost	24.41	41.68	40.39	12.60	12.30	7.05	5.69	3.60	3.10	2.50	153.32
Rich/San Rafael Express	0.40	-	-	-	-	-	-	-	-	-	0.40
San Mateo/Hayward Expr.	-	-	0.50	-	-	-	-	-	-	-	0.50
Fremont/Palo Alto Expr.	-	-	0.50	-	-	-	-	-	-	-	0.50
GGBHTD Express Bus	-	-	-	-	1.60	1.65	1.65	1.70	1.70	1.70	10.00
Napa/Vallejo/Rich. Expr.	-	-	-	0.50	0.50	-	-	-	-	-	1.00
San Ramon Valley Expr.	-	0.40	-	-	-	-	-	-	-	-	0.40
SF Bayshore/SMC Expr.	-	-	-	-	-	1.00	-	-	-	-	1.00
OIA BART Coliseum Bus	0.30	-	-	-	-	-	-	-	-	-	0.30
Special Transit Needs ⁴	0.03	0.06	0.21	0.30	0.37	0.47	0.58	0.62	0.73	0.79	4.16
SUB TOTAL Inter-County Transit Capital Cost	0.73	0.46	1.21	0.80	2.47	3.12	2.23	2.32	2.43	2.49	18.26
Rapid Transit Capital Cost	-	15.00	65.00	185.00	230.00	135.00	50.00	15.00	25.00	70.00	790.00
+ Basic Plan Capital Cost	191.78	89.99	18.46	4.48	4.38	3.18	3.00	3.96	4.20	4.20	327.63
TOTAL MODERATE PLAN CAPITAL COST	216.92	147.13	125.06	202.88	249.15	148.35	60.92	24.88	34.73	79.19	1,289.21

Notes on Table VI-6

1. Full size transit coach costs are estimated at \$100,000. The vehicle itself is assumed to cost \$60,000 plus \$40,000 for its share of new maintenance/operating/administration and other support facilities. Small buses are assumed to cost \$70,000 including the support component. New local service is assumed to consist of an equal mix between full size and small buses unless otherwise specified. Express bus service is assumed to consist of standard full-size coaches only.
2. Recreational transit proposals use off-peak rolling stock and do not therefore involve vehicle capital costs. The only capital items included are fringe parking, terminals, shelters, etc.
3. MUNI costs are pending System Improvement Program with TEP/TIP amendments less \$12 million cost of equipment replacement already included in the Basic Program to maintain the existing system.
4. Most funding for special needs is assumed to be for operations as vehicles can in large part be obtained from the off-peak pool of idle equipment. Only 10% of the total Special Need Program costs are assigned to capital elements.

Table VI-7

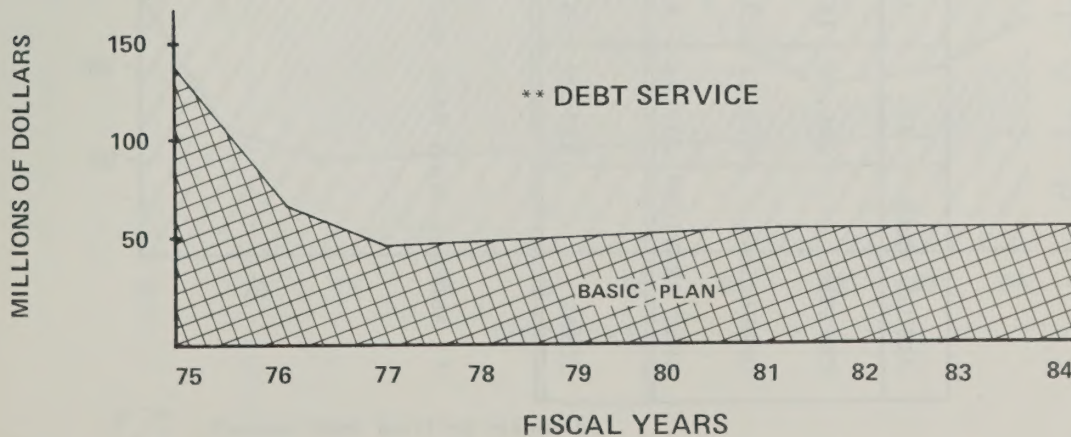
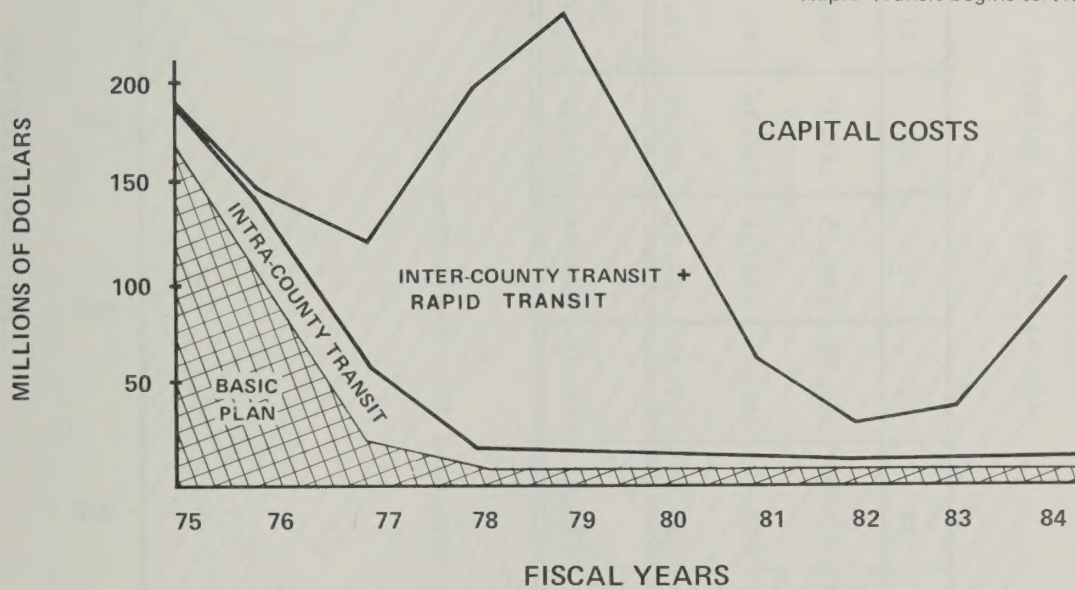
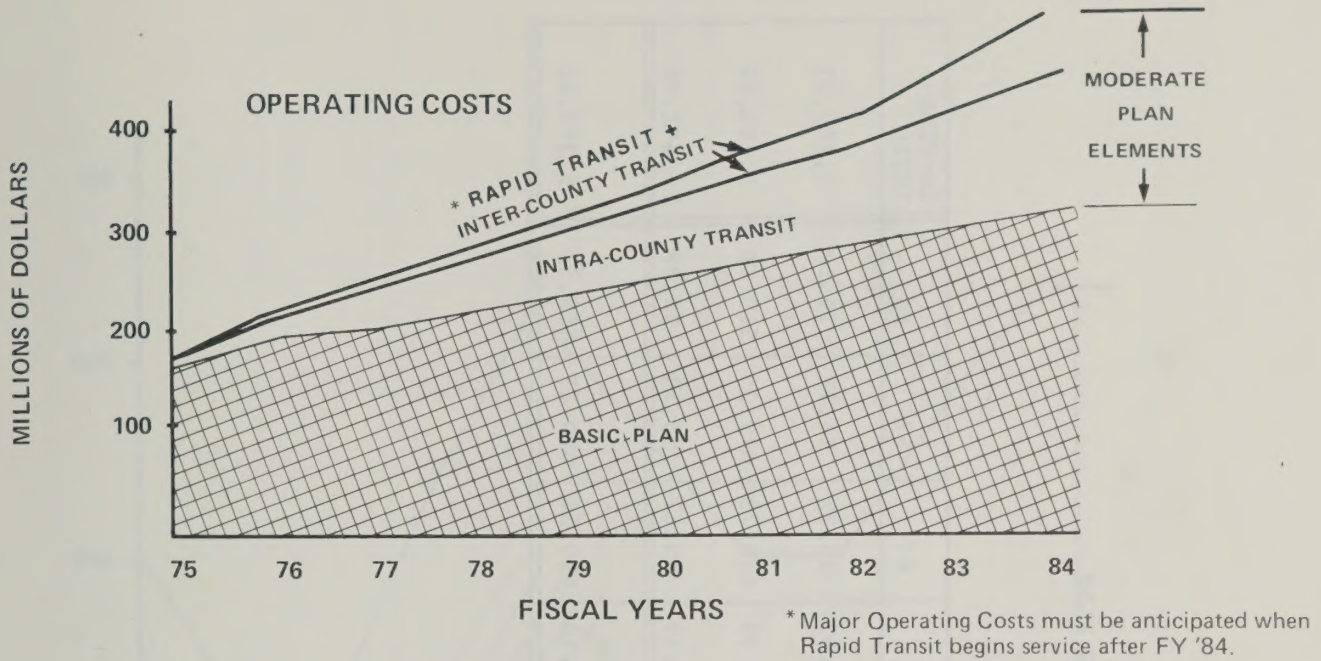
MODERATE TRANSIT DEVELOPMENT PLAN TEN-YEAR TRANSIT OPERATIONS COST											
Fiscal Year	75	76	77	78	79	80	81	82	83	84	10-YEAR TOTAL
Marin Local Transit	2.02	4.32	7.01	7.50	8.03	8.59	9.19	13.07	17.44	22.37	99.54
Marin Recreational ³	0.13	0.29	0.48	0.51	0.55	0.59	0.63	0.67	0.72	0.74	5.34
Sonoma Local	-	.67	1.43	2.30	3.28	4.39	4.70	5.03	5.38	5.78	32.93
Sonoma Recreational ³	-	-	-	-	0.14	0.15	0.16	0.17	0.18	0.19	0.99
Solano Local	-	-	-	0.77	1.64	2.63	3.76	5.03	5.38	5.75	24.96
Napa Local	-	-	-	0.34	0.73	1.17	1.67	2.23	2.39	2.56	11.09
Napa Recreational ³	-	-	-	-	0.14	0.15	0.16	0.17	0.18	0.19	0.99
MUNI Impr. ¹	-	-	-	-	-	-	-	-	-	-	-0-
MUNI Express	-	-	2.87	4.18	4.47	5.76	6.16	6.59	8.24	8.82	47.09
San Mateo Local ³	2.78	5.95	9.56	13.63	18.24	19.51	20.88	22.33	23.89	25.57	162.34
San Mateo Recre. ³	-	-	-	-	0.27	0.29	0.31	0.34	0.36	0.38	1.95
Santa Clara Local	-	-	4.30	9.20	14.77	21.07	28.19	30.15	32.26	34.52	174.46
Cen. Contra Costa Loc.	2.16	4.61	7.41	10.57	14.23	15.22	16.28	17.42	18.64	19.95	126.49
NW Contra Costa Loc.	-	0.22	0.24	0.26	0.27	0.29	0.31	0.34	0.36	0.38	2.67
Tri-Cities Local	1.11	2.46	3.98	4.26	4.56	4.88	5.22	5.58	5.97	6.39	44.41
Livermore/Pleas. Loc	-	0.37	0.80	0.85	0.91	0.98	1.04	1.12	1.19	1.28	8.54
Berkeley Local	-	1.12	1.19	1.28	1.37	1.46	1.57	1.68	1.79	1.92	13.38
SUBTOTAL - Intra-County Transit Operations Cost ²	8.20	20.01	39.27	55.65	73.60	87.13	100.23	111.92	124.37	136.79	757.17
Richmond/S. Rafael Express	0.28	0.30	0.32	0.34	0.36	0.39	0.42	0.45	0.48	0.51	3.85
S. Mateo/Hywd. Express	-	-	0.40	0.43	0.46	0.49	0.52	0.56	0.60	0.64	4.10
Fremont/Pal. Alto Expr.	-	-	0.40	0.43	0.46	0.49	0.52	0.56	0.60	0.64	4.10
GGBHTD Cor. Bus	-	-	-	-	1.37	3.12	5.12	7.37	9.92	12.79	39.69
Napa/Vallejo/Richmond Expr.	-	-	-	0.43	0.91	0.98	1.04	1.12	1.19	1.28	6.95
San Ramon Express	-	0.30	0.32	0.34	0.36	0.39	0.42	0.45	0.48	0.51	3.57
SF Bayshore/SMC Expr.	-	-	-	-	-	0.98	1.04	1.12	1.19	1.28	5.61
Oak Airt. Access	0.21	0.22	0.24	0.26	0.27	0.29	0.31	0.34	0.36	0.38	2.88
Special Needs ⁴	0.27	0.54	1.89	2.70	3.33	4.23	5.22	5.58	2.57	7.11	37.44
SUBTOTAL-Inter-County Transit Operations Cost ²	0.76	1.36	3.57	4.93	7.52	11.36	14.61	17.55	21.30	37.03	108.19
SUBTOTAL - Rapid Transit Operations Cost	-	8.01	8.58	9.18	9.82	10.50	11.24	12.03	23.99	25.66	119.01
+ BASIC PLAN Operations Cost	169.15	190.92	204.00	218.65	234.02	250.77	269.31	288.23	309.60	332.07	2,466.72
TOTAL MODERATE PLAN OPERATIONS COST ^{5,6}	178.11	220.30	255.42	288.41	324.96	359.76	395.29	429.73	479.35	519.66	3,451.09

Notes on Table VI-7

1. Bus or other vehicle replacement capital expenditures imply no corresponding operation cost.
2. An assumption was made to use \$1.30 per vehicle mile as an operating cost base (1974). Also, each vehicle (local and express service) was assumed to operate no more than 50,000 miles per year. Finally, an annual operations cost increase of 7% was used based on data supplied by the operators.
3. Annual vehicle usage for recreational transit was assumed at 15,000 miles.
4. Special transit needs costs were allocated 90% to operations, reflecting the assumed use of capital equipment in the off-peak.
5. Some planning studies estimated operating costs as of the date of report completion; those figures were updated according to the assumed 7% annual cost escalation.
6. Farebox revenues are assumed to cover 33% of total operating costs associated with local and express bus systems. For rail rapid transit systems we assume that 50% of operating costs can be derived from the farebox. Several of the rapid transit studies indicate surplus operating revenues resulting from rail service extension. However, this document takes the conservative approach based on present operating experience.

Figure VI - 5

COST COMPONENTS OF MODERATE TRANSIT DEVELOPMENT PLAN



** Assumes no bonding to underwrite Moderate Plan Capital Costs; some financing alternatives may involve incurring added bonded dept.

Table VI-8

TOTAL COSTS OF MODERATE TRANSIT DEVELOPMENT PLAN

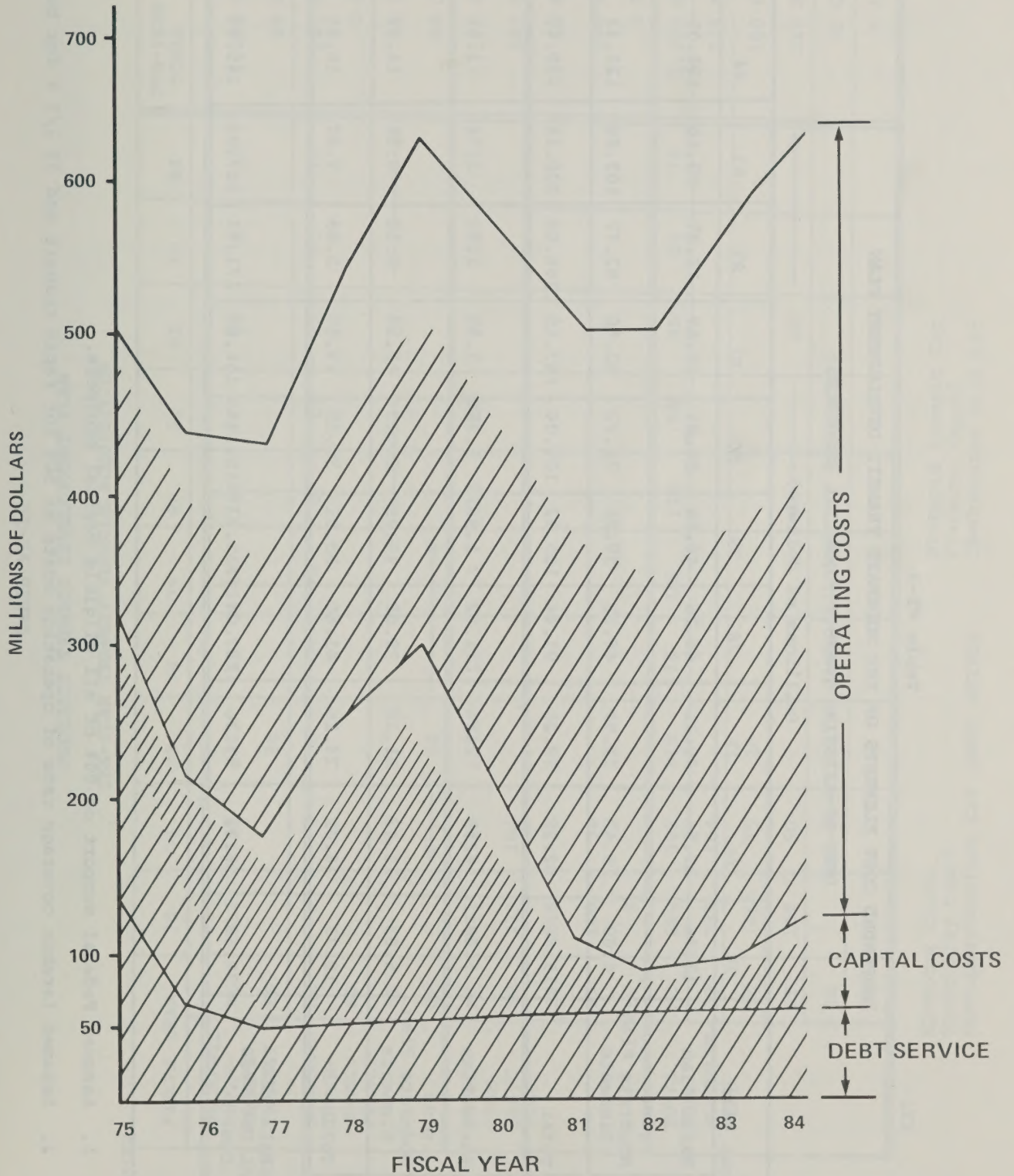
(in millions of dollars)

FISCAL YEAR	75	76	77	78	79	80	81	82	83	84	10-YEAR TOTAL
CAPITAL	216.92	147.13	125.06	202.88	249.15	148.35	60.92	24.88	34.73	79.19	1,289.21
OPERATING	178.11	220.30	255.42	288.41	324.96	359.76	395.39	429.73	479.35	519.66	3,451.09
DEBT SERVICE*	135.96	74.77	51.53	53.39	54.83	55.90	56.79	55.67	56.19	56.72	651.75
TOTAL	530.99	442.20	432.01	544.68	628.94	564.01	513.10	510.28	570.27	655.57	5,392.05

* Assumes bond debt service continued from Basic Plan only.

Figure VI-6

MODERATE TRANSIT DEVELOPMENT PLAN COMBINED COST CHART



Funded from existing resources



Funded assuming 80% Capital Grant support by UMTA of all eligible projects.

Table VI-9

UNFUNDED COST ELEMENTS OF THE MODERATE TRANSIT DEVELOPMENT PLAN

(NET OF EXISTING TRANSIT FINANCIAL RESOURCES)

(millions of dollars)

Fiscal year		75	76	77	78	79	80	81	82	83	84	10-YEAR TOTAL
OPERATIONS	Basic Plan	13.86	23.56	40.21	46.26	46.66	50.81	60.59	73.27	90.50	108.09	553.81
	plus Moderate Plan Elements	6.00	18.63	32.99	45.18	59.26	71.23	82.56	92.77	109.66	121.33	639.61
	TOTAL	19.86	42.19	73.20	91.44	105.92	122.04	143.15	166.04	200.16	229.42	1,193.42
CAPITAL	Basic Plan	5.69	4.59	2.84	1.92	1.96	1.36	1.32	1.51	1.56	1.56	24.31
	plus Moderate Plan Elements	5.03	11.43	21.32	39.68	48.95	29.03	11.58	4.18	6.11	14.99	192.32
	TOTAL	10.72	16.02	24.16	41.60	50.91	30.39	12.90	5.69	7.67	16.55	216.63
MODERATE PLAN TOTAL UNFUNDED COST		30.58	58.21	97.36	133.04	156.83	152.43	156.05	171.73	207.83	245.97	1,410.05

NOTES:

1. Assumes Federal support of 80% of all eligible capital projects.
2. Assumes farebox coverage rate of operating costs at 50% for rapid transit and 33 1/3 % for bus services.

Table VI-10

MODERATE TRANSIT DEVELOPMENT PLAN
TEN-YEAR TRANSIT VEHICLE ACQUISITION

FISCAL YEAR		75	76	77	78	79	80	81	82	83	84	TEN-YEAR TOTAL
MODERATE INTRA- COUNTY TRANSIT	MC	116	149	222	160	148	86	67	42	39	29	1,058 MC
	SS			20								20 SS
MODERATE INTER- COUNTY TRANSIT	MC	7	4	10	5	20	27	17	17	17	17	141 MC
	SS											0 SS
	RT						←		60	→		60 RT
	CR		←	60	→							60 CR
TOTAL FROM BASIC PLAN	MC	571	349	108	11	13	13	10	26	30	30	1,161 MC
	TR	239	104									343 TR
	SS	45	35									80 SS
	RT	100	50									150 RT
	FV	3										3 FV
TOTAL FOR MODERATE PLAN	MC	694	502	340	176	181	126	94	85	86	76	2,360 MC
	TR	239	104									343 TR
	SS	45	35	20								100 SS
	RT	100	50				←		60	→		210 RT
	CR		←	60	→							60 CR
	FV	3										3 FV

KEY:

MC=Motor Coach
TR=Trolley Coach
SS=Subway/Surface Car (MUNI METRO)

RT=Rapid Transit Car
FV=Ferry Vessel
CR=Commuter Rail Car

Estimates of unfunded cost assume that all scheduled capital investments will receive 80% funding support from UMTA. Finally, Table VI-10 provides the projected annual transit vehicle requirements for the Moderate Plan.

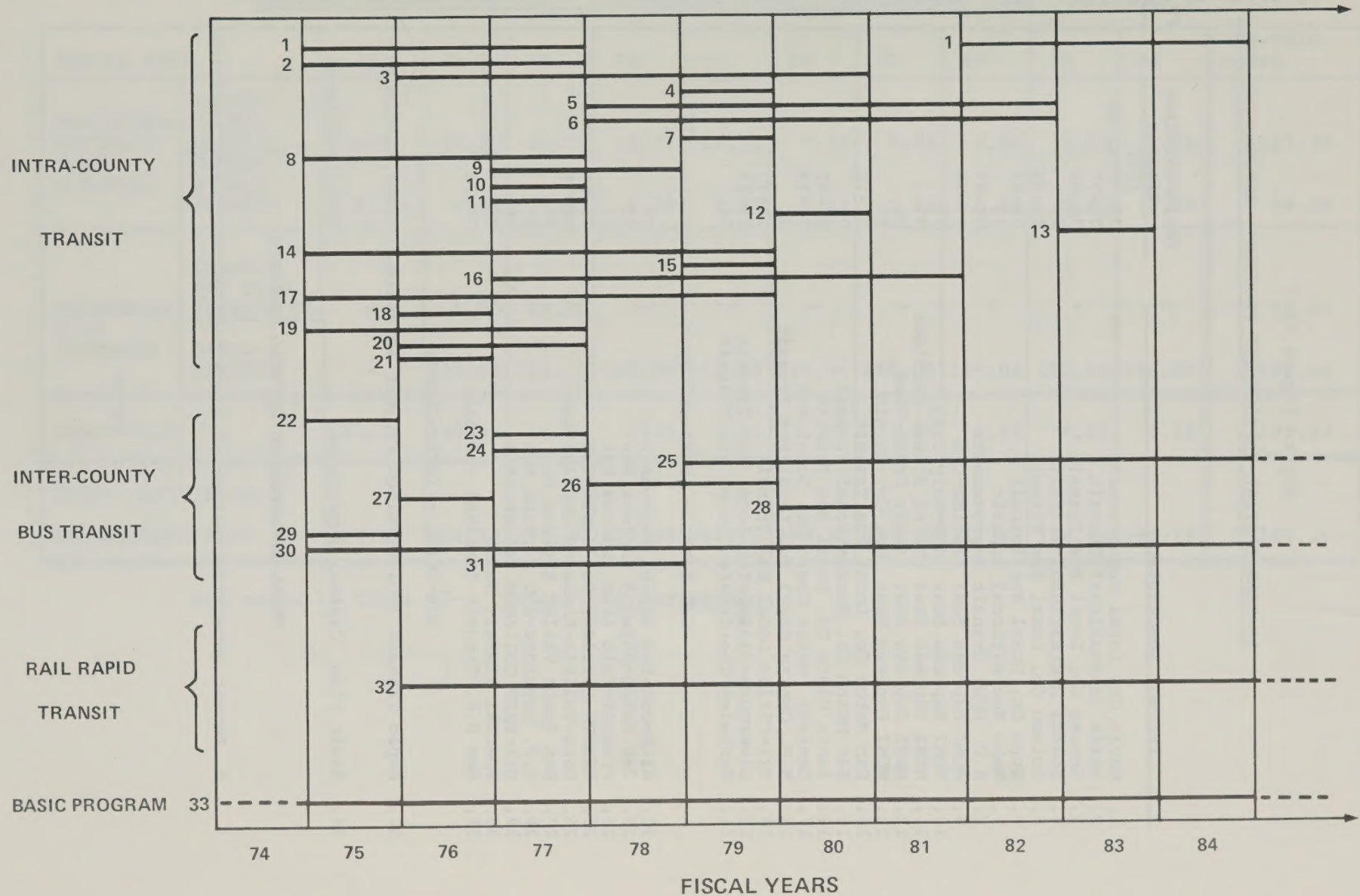
E. RECOMMENDED TRANSIT DEVELOPMENT PLAN

The Recommended Transit Development Plan differs from the Moderate Plan only in that more funds are assumed to be available to construct capital-intensive rapid transit extensions and therefore the regional transit system more fully implements the objectives of the Regional Transportation Plan. This permits more mileage of grade-separated rapid transit to be built during the next decade and at a faster rate. Altogether the Recommended Plan will involve \$2,184 million in capital expenditures, \$3,484 million in operating costs, and the continued debt service on bonds already issued for a grand total of \$6,320 million by FY-1984.

Figure VI-7 illustrates the transit projects proposed for the Recommended Transit Development Plan and indicates the programs for construction. Tables VI-11 and VI-12 portray staged operating and capital costs for this Plan. Despite the addition of substantial capital cost in the Recommended Plan over those proposed in the Moderate Plan, the long construction time of rapid transit projects will not result in greatly increased transit service becoming

Figure VI-7

STAGING OF 10-YR. CAPITAL IMPROVEMENT PROGRAM - RECOMMENDED PLAN



Key to Figure VI-7

10-YEAR CAPITAL IMPROVEMENT PROGRAM - RECOMMENDED PLAN

<u>Project Description</u>	<u>Implementation Staging (FY)</u>	<u>FY 75-84 Programmed Capital Cost (\$ millions)</u>
1. Marin Co. Local Bus Transit	75-77;82-84	15.00
2. Marin Recreational Transit	75-77	0.75
3. Sonoma Co. Local Bus Transit	76-80	3.80
4. Sonoma Recreational Transit	79	0.10
5. Solano Co. Local Bus Transit	78-82	3.80
6. Napa Co. Local Bus Transit	78-82	1.70
7. Napa Recreational Transit	79	0.10
8. S.F. MUNI Transit Improvements	75-77	68.00
9. MUNI Express Bus: Marina-CBD	77-78	1.50
10. MUNI Express Bus: GGB-Daly City	77	0.72
11. MUNI Express Bus: Third Street Corridor	77	0.72
12. MUNI Express Bus: Inner Cross-Town	80	0.60
13. MUNI Express Bus: So. Co. Margin	83	0.60
14. San Mateo Co. Local Bus Transit	75-79	17.00*
15. San Mateo Co. Recreational Transit	79	0.25
16. Santa Clara Co. Local Bus Transit	77-81	22.95
17. Central Contra Costa Co. Local Bus	75-79	10.00
18. N.W. Contra Costa Co. Local Bus Transit	76	0.03
19. Tri-Cities Local Bus Transit	75-77	3.80
20. Livermore-Pleasanton Local Bus Transit	76-77	0.85
21. Berkeley Coordinated Local Bus Transit	76	1.05
SUB TOTAL - INTRA-COUNTY		153.32
22. Richmond-San Rafael Express Bus	75	0.40
23. San Mateo-Hayward Express Bus	77	0.50
24. Fremont-Palo Alto Express Bus	77	0.50
25. GGBHTD Corridor Bus Expansion	79-84 continued	10.00
26. Napa-Vallejo-Richmond Express Bus	78-79	1.00
27. San Ramon Valley Express Bus	76	0.40
28. S.F. Bayshore-SMC Express Bus	80	1.00
29. OIA-BART Coliseum Bus Shuttle	75	0.30
30. Special Transit Needs	75-87 continued	4.16
31. New S.F. Transit Terminal - Public	77-78	20.00
SUB-TOTAL - INTER-COUNTY		38.26
32. Rapid Transit (Undetermined Project Selection)	76-84 continued	1,665.00
33. Basic Plan Capital Improvement	75-84 continued	327.63
TOTAL RECOMMENDED CAPITAL PROGRAM:		2,184.21

* Recent consultant estimates place capital cost at \$27 million.

Table VI-11

CAPITAL PROGRAM SCHEDULE - RECOMMENDED TRANSIT DEVELOPMENT PLAN (millions of dollars)

FISCAL YEAR		75	76	77	78	79	80	81	82	83	84	TEN-YEAR TOTAL
UNALTERED MODERATE PLAN ELEMENTS	INTRA- COUNTY TRANSIT	24.41	41.68	40.39	12.60	12.30	7.05	5.69	3.60	3.10	2.50	153.32
	INTER- COUNTY TRANSIT	0.73	0.46	1.21	0.80	2.47	3.12	2.23	2.32	2.43	2.49	18.26
RECOMMENDED PLAN ELEMENTS	TRANS- BAY TERM. IMPROV'M'TS.	-	5.00	15.00	-	-	-	-	-	-	-	20.00
	RAPID TRANSIT	-	15.00	115.00	160.00	245.00	270.00	220.00	235.00	215.00	190.00	1,665.00
BASIC PLAN		191.78	89.99	18.46	4.48	4.38	3.18	3.00	3.96	4.20	4.20	327.63
TOTAL CAPITAL COST RECOMMENDED PLAN		216.92	152.13	190.06	177.88	264.15	283.35	230.92	244.88	224.73	199.19	2,184.21

See notes to Table VI-6 for costing assumptions.

Table VI-12

TRANSIT OPERATING COSTS FOR RECOMMENDED TRANSIT DEVELOPMENT PLAN

(millions of dollars)

Fiscal Year		75	76	77	78	79	80	81	82	83	84	10-YEAR TOTAL
UNALTERED MODERATE PLAN ELEMENTS	INTRA- COUNTY TRANSIT	8.20	20.01	39.27	55.65	73.60	87.13	100.23	111.92	124.37	136.79	757.17
	INTER- COUNTY TRANSIT	0.76	1.36	3.57	4.93	7.52	11.36	14.61	17.55	21.39	25.14	108.19
RECOMMENDED PLAN ELEMENTS	RAPID TRANSIT	-	8.01	8.58	9.18	9.82	10.50	13.65	14.61	35.28	42.32	151.95
BASIC PLAN		169.15	190.92	204.00	218.65	234.02	250.77	269.31	288.23	309.60	332.07	2,466.72
TOTAL OPERATION COST RECOMMENDED PLAN		178.11	220.30	255.42	288.41	324.96	359.76	397.80	432.31	490.64	536.34	3,484.03

Notes: See Notes to Table VI-7 for costing assumptions.

operational until 1984 or somewhat later. Therefore operating costs are not added at as fast a rate as capital costs.

There are no significant new additions to local and express bus service in moving from the Moderate to the Recommended Plan. Added expenditures are concentrated in capital costs of rail rapid transit.

Table VI-13 gives the total costs for the Recommended Transit Development Plan Alternative. Table VI-14 indicates the amount of funding required for this plan which cannot be secured from current revenue sources. Table VI-15 is a ten-year schedule of transit equipment acquisition. The ability of current financial resources to meet the costs of the Recommended Plan is shown graphically in Figures VI-8 and VI-9. The unfunded operations costs are double those of the Basic Plan, while unfunded capital costs increase six times for a grand total of \$1,596 million in required new funds.

Table VI-13

TOTAL COSTS OF RECOMMENDED TRANSIT DEVELOPMENT PLAN

(millions of dollars)

FISCAL YEAR	75	76	77	78	79	80	81	82	83	84	10-YEAR TOTAL
CAPITAL	216.92	152.13	190.06	177.88	264.15	283.35	230.92	244.88	224.73	199.19	2,184.21
OPERATING	178.11	220.30	255.42	288.41	324.96	359.76	397.80	432.31	490.64	536.32	3,484.03
DEBT SERVICE*	135.96	74.77	51.53	53.39	54.83	55.90	56.79	55.67	56.19	56.72	651.75
TOTAL	530.99	447.20	497.01	519.68	643.94	669.01	685.51	732.86	771.56	792.23	6,319.99

* Assumes bond debt service continued from Basic Plan only.

Table VI-14

UNFUNDED COST ELEMENTS OF RECOMMENDED TRANSIT DEVELOPMENT PLAN

(NET OF EXISTING TRANSIT FINANCIAL RESOURCES)
(in millions of dollars)

FISCAL YEAR		75	76	77	78	79	80	81	82	83	84	10-YEAR TOTAL
OPERATIONS	BASIC PLAN	13.86	23.56	40.21	46.26	46.66	50.81	60.59	73.27	90.50	108.09	553.81
	plus NEW RECOMMENDED PLAN ELEMENTS*	6.00	18.63	32.99	45.18	59.26	71.23	83.76	94.06	111.04	124.78	646.93
	TOTAL	19.86	42.19	73.20	91.44	105.92	122.04	144.35	167.33	201.54	232.87	1,200.74
CAPITAL	BASIC PLAN	5.69	4.59	2.84	1.92	1.96	1.36	1.32	1.51	1.56	1.56	24.31
	plus NEW RECOMMENDED PLAN ELEMENTS*	5.03	12.43	34.32	34.68	51.94	56.03	45.58	48.18	44.11	38.99	371.32
	TOTAL	10.72	17.02	37.16	36.60	53.90	57.39	46.90	49.69	45.67	40.55	395.63
RECOMMENDED PLAN TOTAL UNFUNDED COST		30.58	59.21	110.36	128.04	159.82	179.43	191.25	217.02	247.21	273.42	1,596.37

* Includes most Moderate Plan elements.

1. Assumes Federal support of 80% of all eligible capital projects.
2. Assumes farebox coverage rate of operating costs at 50% for rapid transit and 33 1/3% for bus service.

TABLE VI-15

RECOMMENDED TRANSIT DEVELOPMENT PLAN--TEN-YEAR VEHICLE ACQUISITION

FISCAL YEAR		75	76	77	78	79	80	81	82	83	84	TEN-YEAR TOTAL
UNALTERATED MODERATE PLAN ELEMENTS	MC	123	153	232	165	168	113	84	59	56	46	1,199 MC
	SS			20								20 SS
	RT						←		60	→		60 RT
RECOMMENDED PLAN ELEMENTS	SS						←		80	→		80 SS
	RT						←		90	→		90 RT
	CR		←	40	→							40 CR
	TF						←		30	→		30 TF
BASIC PLAN ELEMENTS	MC	571	349	108	11	13	13	10	26	30	30	1,161 MC
	TR	239	104									343 TR
	SS	45	35									80 SS
	RT	100	50									150 RT
	FV	3										3 FV
TOTAL RECOMMENDED PLAN	MC	694	502	340	176	181	126	94	85	86	76	2,360 MC
	TR	239	104									343 TR
	SS	45	35	20			←		80	→		180 SS
	RT	100	50				←		150	→		300 RT
	CR		←	40	→							40 CR
	TF						←		30	→		30 TF
	FV	3										3 FV

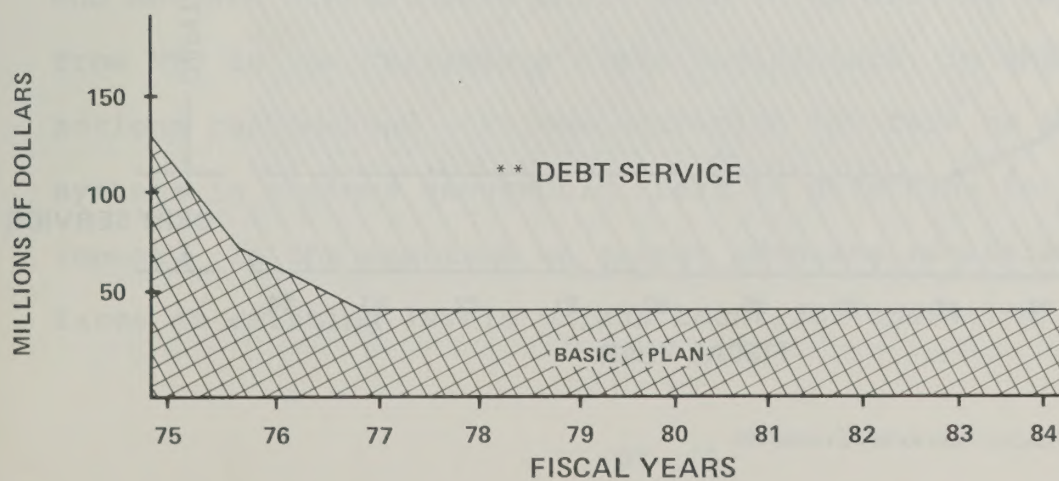
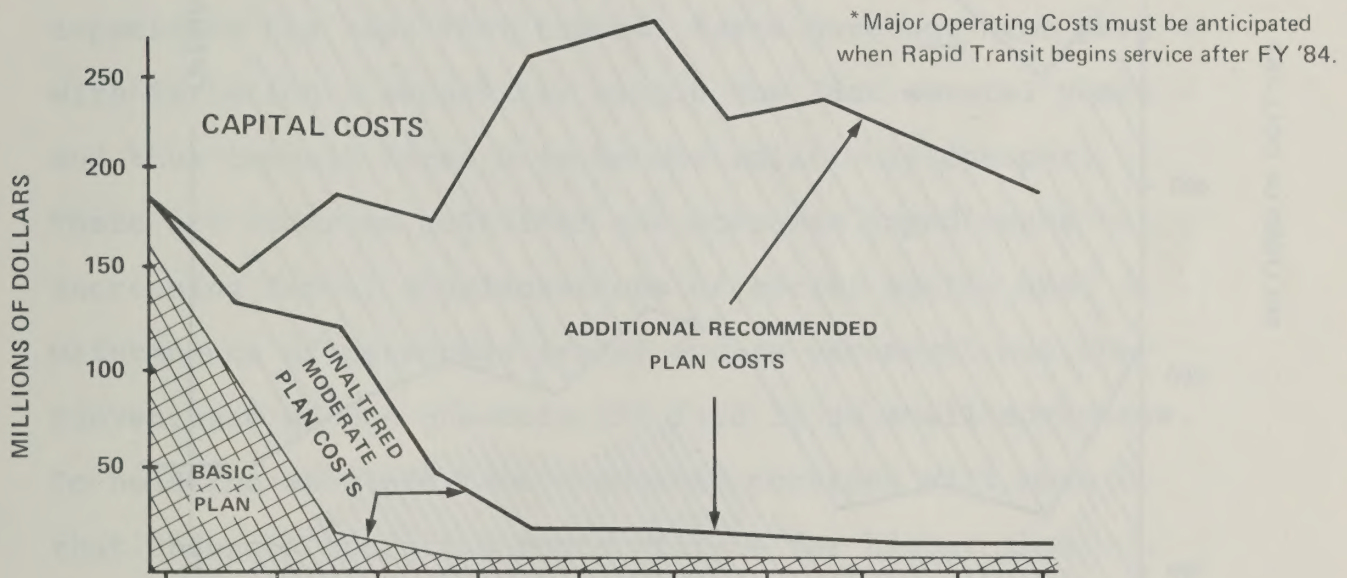
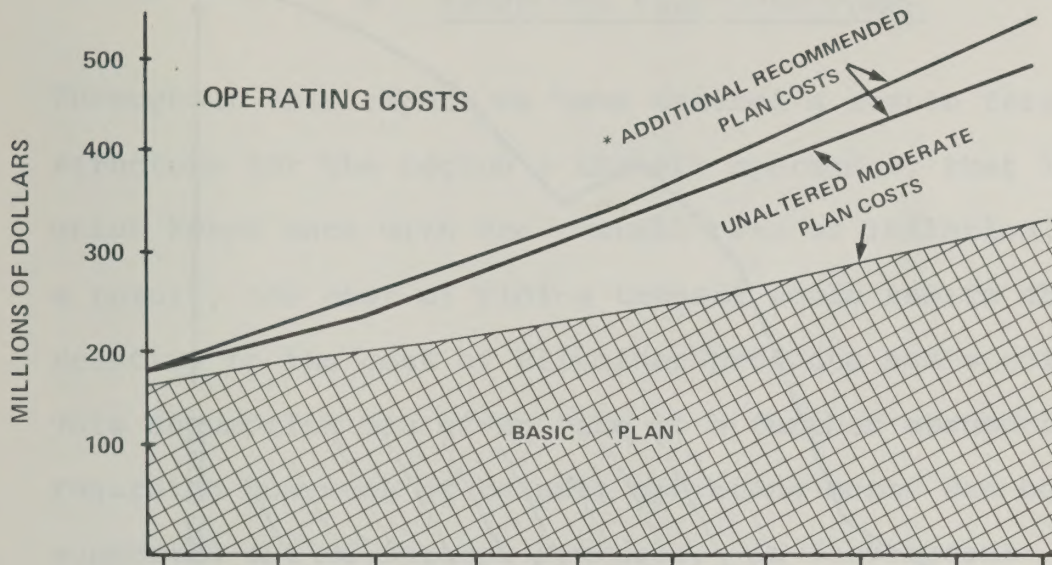
KEY:

MC=Motor Coach
 SS=Subway/Surface Car (MUNI-METRO)
 TR=Trolley Coach
 RT=Rapid Transit Car

CR=Commuter Rail Car
 TF=Transit Vehicle (Fixed Guideway)
 FV=Ferry Vessel

Figure VI - 8

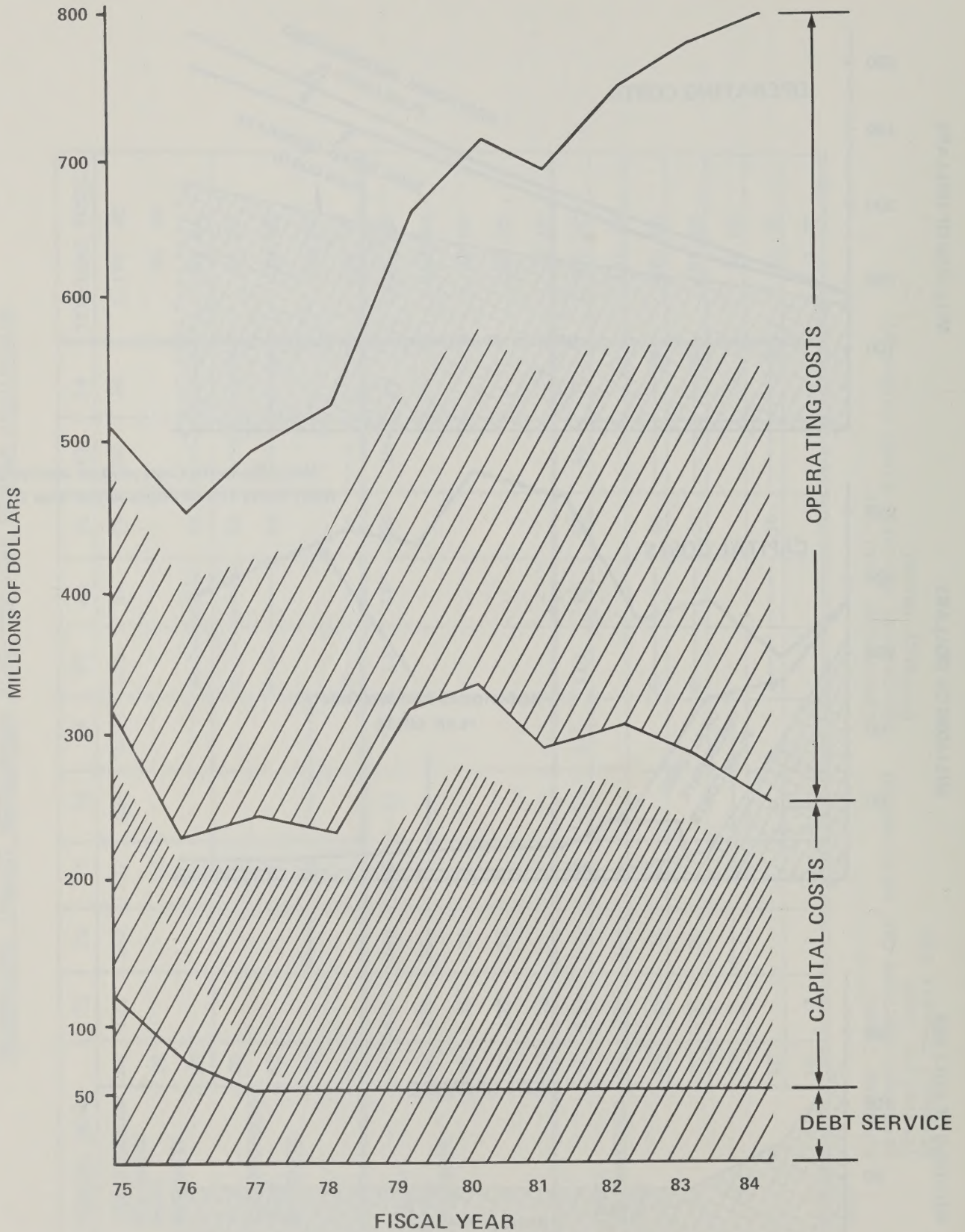
COST COMPONENTS OF RECOMMENDED TRANSIT DEVELOPMENT PLAN



** Assumes no bonding to underwrite Cost of Recommended Plan Capital Expense; some financing alternatives may involve incurring additional bonded dept.

Figure VI-9

RECOMMENDED TRANSIT DEVELOPMENT PLAN COMBINED COST CHART



F. PROJECTED FARE STRUCTURES

Throughout this report we have assumed a stable fare structure for the region's transit operators, that is, one which keeps pace with the overall rate of inflation. As a result, the cost of riding transit would remain the same relative to the cost of all other products and services. This assumption has given rise to a further assumption regarding how much of transit operating costs can be supported out of farebox revenues. In fact recent experience has been that transit fares have not kept pace with inflation - especially within the last several years - and thus transit fares have become relatively cheaper. There are numerous political and economic impediments to increasing fares; considerations of social equity and maintenance of patronage are of course paramount but the convenience of the one-coin 25¢ fare is no small advantage. To hold the absolute fare structure constant will mean that unfunded operating costs will be far higher than assumed in this report. Many of the issues of low-fare and no-fare transit were dealt with in an earlier report from MTC to the California State Legislature, in which the actions recommended were demonstration low-fare or no-fare systems in various geographic areas to determine their impact. In the meantime we cannot advocate retention of fares at existing levels unless bountiful operating

subsidies are obtained beyond anything mentioned so far in this report. Failing this - and optimism seems unwarranted in view of the escalating operating costs of an expanded transit system - we can only suggest selectively raising transit fares in such a way as to least affect the transit-dependent groups. For example, fares could be raised for peak-hour travel only, a time dominated by employed persons traveling to jobs. Or, across-the-board transit fare increases could be mitigated by discounted transit passes provided to special groups. The de-emphasis of fare collection at transit boarding points and the institution of pre-paid fare systems (such as now utilized by BART) will lessen the necessity of keeping a one-coin convenience fare. It is possible that ultimately fare revenues will come to cover such a small portion of transit operating costs that it will be advantageous to dispense with them altogether by making public transit wholly supported through tax revenues, i.e. institute "free" transit, but this is not likely within the coming decade.

G. SUMMARY OF TRANSIT DEVELOPMENT PLAN ALTERNATIVES

The three Transit Development Plan alternatives are summarized in Figure VI-10 and Table VI-16. These three alternative transit development plans have several features in common; namely, the continued support of the existing and committed

transit system, various low capital-intensive projects, transit coordination, and an improved local and express bus transit system. The transit improvements common to all three plans involve a relatively low level of capital investment over the next decade. However, there is a significant operating cost attached to these improvements, most of which is attributable to the transit system now in operation, and is indicative of the transit operating funds crisis now appearing day-by-day, system-by-system.

The difference between the Transit Development Plan alternatives (Moderate and Recommended) lies primarily in the amount of rail rapid transit proposed for construction over the next ten years. This is indicative of a higher priority having been attached not to rail rapid transit, but to local and express bus services, operating on existing road networks. If capital and operating funding can be obtained for rail rapid transit expansion, then the projects listed in the Moderate and Recommended Plans should be considered for implementation as scheduled in conjunction with the less expensive surface bus projects.

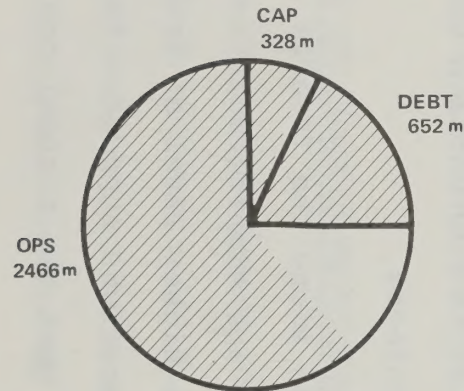
The operating cost differences among the Transit Development Plan alternatives are significant, as each capital expenditure creates a higher level of transit service requiring greater operations support. Furthermore, it is important to recognize that the capital cost elements

COMPARISONS OF TRANSIT DEVELOPMENT PLAN ALTERNATIVES

(CAP) COMPARISON OF CAPITAL

BASIC PLAN

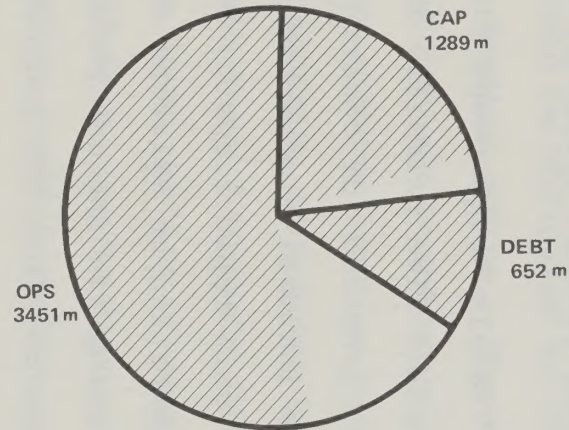
Total Cost \$3446 Million



(DEBT) DEBT SERVICE COSTS OF ALTERNATIVE TRANSIT DEVELOPMENT PLANS

MODERATE PLAN

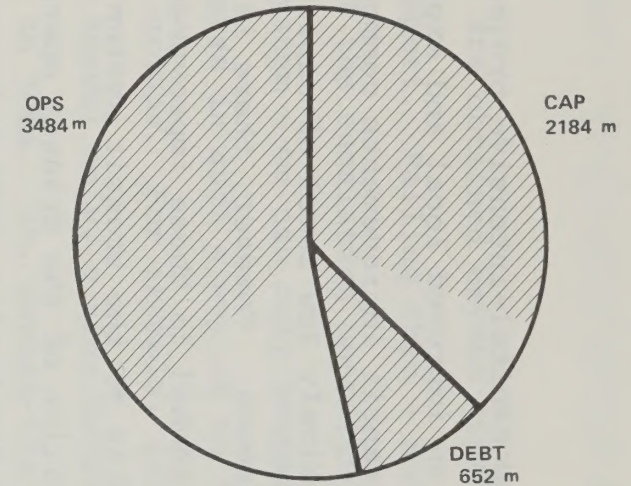
Total Cost \$5392 Million



(OPS) OPERATING

RECOMMENDED PLAN

Total Cost \$6320 Million



FIGURES IN MILLIONS OF DOLLARS

SHADED AREAS INDICATE : PORTIONS OF COST FOR WHICH FUNDING SUPPORT IS NOW AVAILABLE

Assumes funding of 80% of capital projects by URBAN MASS TRANSPORTATION ADMINISTRATION
and increased Federal appropriations consistent with expenditure level given

THIS PLAN INCLUDES

- Operate & maintain existing and committed transit System
- Minimum levels of local / Feeder transit
- Transit Preferential Streets
- Transit Coordination

THIS PLAN INCLUDES

- All Elements of Basic Plan
- New Express & Local Bus Service
- Acquire Rights-of-Way for future Transit lines
- Begin construction of selected Rapid Transit Projects valued at \$790 Million.

THIS PLAN INCLUDES

- All Elements of Basic Plan
- New Express & Local Bus Service
- Acquire Rights-of-Way for future Transit lines
- Begin construction of selected Rapid Transit Projects valued at \$1665 Million.

TABLE VI-16
COMPARATIVE COST-TRANSIT DEVELOPMENT PLANS
(IN MILLIONS OF DOLLARS)

COST ITEM	BASIC	MODERATE	RECOMMENDED
TEN-YEAR CAPITAL COST	\$ 328	\$ 1289	\$ 2184
TEN-YEAR OPERATING COST	2466	3451	3484
TEN-YEAR DEBT SERVICE*	652	652	652
TEN-YEAR TOTAL COST	3446	5392	6320
UNFUNDED CAPITAL PORTION**	24	217	396
UNFUNDED OPERATING PORTION	554	1193	1201
TOTAL TEN-YEAR UNFUNDED COST	\$ 578	\$ 1410	\$ 1597

* DEBT SERVICE COSTS SUBJECT TO 100% ASSURED FUNDING.

** ASSUMES 80% CAPITAL PROJECT FUNDING BY FEDERAL GOVERNMENT.

NOTE: SOME FINANCING PLANS MAY INVOLVE INCURRING ADDITIONAL BONDED INDEBTEDNESS.

of these ten-year expenditure plans have unavoidable major cost implications beyond the ten-year period. For example, the Moderate and Recommended Plans will involve the beginning, but not the end, of some rail transit projects within the coming decade, thus obligating some capital expenditures beyond 1984. And more importantly, all rail rapid transit projects scheduled for completion near the end of the decade or beyond 1984 will obligate substantial amounts of operations costs which will not be felt in this decade but the following one.

The ability of current resources to meet the costs of the Basic, Moderate and Recommended Transit Development Plan alternatives is shown graphically in Figure VI-10. The unfunded operations costs of the Moderate and Recommended Plans at least double those of the Basic Plan, while capital costs increase by at least a factor of eight. Assuming that the Federal Capital Grants programs will fund 80% of the cost of scheduled improvements (and this is an unsubstantiated assumption at the present time), the Moderate and Recommended Plans are approximately 75% fundable with current sources of revenue, while the Basic Plan is around 70% fundable. Potential sources for filling these financial gaps is the subject of Chapter VIII.

TRANSIT COORDINATION

The MTC Regional Transportation Plan of June 1973 emphasized the coordination of transportation services within the Bay Area, and in particular the coordination of the various transit operators. The Regional Transportation Plan listed a number of functional areas within which benefits of coordination could be achieved, and recommended the formation of a Transit Federation which would work with MTC to implement a coordinated public transportation system in the Bay Area. Since June of 1973 MTC technical staff has developed a detailed program for the Transit Federation. The transit operators are presently organizing the Transit Federation and MTC has recently hired a staff person expressly for the Federation program. Since June of 1973 most efforts in transit coordination have related to organizing the Federation and implementing UMTA-funded coordination technical studies.*

Much background information on the need for better coordinated public transit in the region is given in Chapter III.** The number of operators, their artificial geographic boundaries,

*AC/BART Coordination Project and MUNI/BART Coordination Project

**See Chapter III, Part E, for description

their systems of revenue collection, their methods of information dissemination, etc., all contribute to the confusion the transit patron suffers. The fragmented character of the transit operating agencies leads to difficulties in expanding services as well as limiting opportunities for taking advantage of economies of scale.

The MTC's present position on transit coordination advocates voluntary coordination programs participated in by various operators. No formal consolidation of transit operators is suggested, partially in recognition of the fact that there are certain diseconomies of largeness in operating agencies such as inattentiveness to local needs and problems.* Therefore, the transit coordination program has been designed to be implemented essentially within the existing institutional framework. It remains to be seen whether coordination can be effected voluntarily within the institutional framework. The Transit Federation will provide a Forum for initiating and improving coordination efforts, but individual operator commitment and cooperation will be the key to success.

The staff of MTC developed a program for transit coordination consisting of proposals in a number of areas. Chapter IV described the highest priority parts of the transit coordina-

*MTC does seek to discourage transit district proliferation, however, especially the formation of districts less than county-wide in scope.

tion program and Chapter VI recommended them for inclusion in the Basic Transit Development Plan. Among the highest priorities is the duplication of a comprehensive regional transit guidebook. The other work areas proposed for the Transit Federation are listed below.

A. Conduct Inventory of Transit Assets in the Bay Area:

Data will be compiled of all transit operators' services, equipment, terminals, etc. A continually updated file of this information would be maintained by MTC. Already substantial progress has been made in this area as a result of the preparation of this report, the compilation of data for the National Transportation Survey, and in connection with MTC's transportation modeling projects.

B. Coordinated Research and Evaluation: Work would focus on evaluating current transit services and suggesting service expansion. Standardized procedures would be developed for collecting and analyzing data on transit services such as patronage, speed, miles of service, etc. This element would also involve monitoring of transit service and patronage to assess the impact of coordination programs on ridership. Finally,

demonstration programs would be recommended, such as low-fare/no-fare service, travel stamp programs for special groups, etc. Some of this work is presently being accomplished by various technical studies but is not yet performed on a coordinated regional basis.

C. Develop Coordinated Transit Information Aids:

In addition to the publication of the comprehensive transit information guidebook described in Chapter IV, the following transit information aids are to be developed:

1. Regional Transit Information Supplements for Telephone Directories, including Route Maps;
2. Standardized-design timetables emphasizing readability and ease of use;
3. Standardized transit route maps in pocket format (display with timetables) and for outdoor installations;
4. Standardized bus stop markers;
5. Standardized on-vehicle bus destination and routing signs;
6. Regional transit route numbering system;
7. Program of transit information courtesy phones at heavily-trafficked locations;
8. Regional Transit Information Center with data on all public transit operations, reachable from all locations at no or low cost.

- D. Coordinated Advertising and Promotion: This element will consist of developing regionwide paid and public service advertising of transit services and will investigate the feasibility of direct promotion (selling) of transit services to major travel generators such as large employers.
- E. Operations and Facilities Coordination: Analysis will be made of requirements for new routes and services, renovation of facilities, coordination of scheduling and routing, and street furniture.
- F. Coordinated Fare and Transfer Procedures: This work element will develop plans to rationalize fare schedules, collection procedures, and ticketing among the various transit operators. Consideration will be given to pooled revenues (and allocation), through-ticketing, regional transportation tokens, adaptation of BART ticketing system for use on bus vehicles, and transit credit cards.
- G. Equipment Coordination: Evaluation will be made of benefits of standardizing transit operation equipment and pooled purchases of same. The worth of joint spare parts inventories will be analyzed, as well as joint use of more elaborate maintenance facilities. Analysis will also be made of the value

of joint use of capital equipment between various operators to meet localized surges of demand, etc.

H. Review Regional Regulation and Public Participation:

Citizen advisory group organization structures will be reviewed for providing public input to the Transit Federation. The feasibility and benefit of MTC's obtaining PUC-type regulatory powers over intra-regional carriers will also be considered.

I. Para-Transit Service Integration: An analysis will

be made of para-transit services in the region, including taxis, jitneys, charter buses, rental cars, shuttles, etc., evaluating these services their role in the total transport environment. Consideration will be given to utilizing or improving these types of service to augment and complement the large public transit system, especially with respect to providing feeder services and services to special (low-mobility) groups. This work would be closely coordinated with MTC's current Special Transit Needs Study.

The above represents an ambitious program for transit coordination which it will not be possible to implement in one or two years. Rather, it has been proposed that the

Transit Federation concentrate immediately on public information programs and gradually move into other areas.

Accordingly Section VI assumed a budget for the Federation of \$200,000 for the fiscal year 1974-75, gradually increasing to \$800,000 for fiscal year 1983-84. This budget would not only provide for the staff of the coordination projects but would also involve some sizeable costs of publications, rental, communications, etc. essential to the implementation of transit coordination.

Chapter VIII

FINANCING ALTERNATIVES

It has been pointed out that continuing to operate the existing and committed transit system of the Bay Area will necessitate securing over \$460 million from new funding sources by 1984. If any quantitative and/or qualitative improvements are to be implemented in the region's transit system such as those envisioned in the Basic, Moderate, and Recommended Plans described in Chapter VI, far more substantial new revenue sources must be developed. Particularly difficult to obtain under existing legislation will be operating support revenues, the inevitable requirement for maintaining and improving a transit system. The notion that transit should pay its own operating costs from fares and other direct revenues is slowly giving way to the philosophy that transit is a vital public service which should be supported in part from public tax sources. Nevertheless, legal restrictions on operating cost support continue to critically hinder transit system maintenance and expansion.

A. TRANSIT FINANCING TRENDS AT THE NATIONAL LEVEL

Current legislation, UMTA Act of 1964 as amended and Federal Aid Highway Act of 1973, provides funds for transit capital expenses. The federal share of UMTA funding is 80 percent of the total eligible capital projects and highway transfer

funds are 70%. Pending legislative proposals envision continuation of this type of program, with a greater funding base and some discretion between modes as well as provision for limited support of specified operating expenses. Included in present proposals is the continued reservation of funds for capital assistance on major transit projects. Most current transit projects in the Bay Area utilize UMTA program assistance in capital expenditures.

1. Greater Flexibility in Funding Among Modes

Current legislation, the Federal Aid Highway Act of 1973, allows some flexibility between highway and transit projects in certain programs. Many transit support projects are eligible under most highway construction programs. More flexibility with choices being made at the state and local level is proposed in pending legislation. Competition between transit and highway modes for funds will be keen, and guidelines restrict the types of transit - rail, fixed guideway or bus - and categories of expenses - capital or operating - that will be eligible for consideration. The reduction in highway generated funds comes at a time when the funds are first being opened to non-highway transportation projects. As proposed in the Unified Transportation Assistance Program (UTAP), urban highway and transit funding would eventually be merged in a single program to fund highway and transit construction with the possibility of transit operating assistance.

2. Support of Operating Expenses

Present federal programs do not provide support for transit operating expenses. Legislation to provide operating expenses has passed Congress and been vetoed; however, new legislation again providing operating assistance is pending and support is more wide-spread. Entry into support of operating expenses by the federal government can be expected to parallel somewhat that of modal flexibility. Pending legislation provides "maintenance of effort" clauses which stipulate that any assistance shall be used to improve or maintain existing service, rather than totally underwrite all unmet or previously financed operating expenses. Non-federal operating assistance is expected to increase in the future and these new funds could be used as a match for federal operating funds, similar to existing capital assistance programs.

Operating assistance will probably be offered as a local option to using the same funds for transit capital assistance, and possibly as an option to their use in urban highway construction projects as well. Both the proposed Unified Transportation Assistance Act of 1974 (UTAA) and UTAP provide operating assistance on a similar basis.

3. Apportionment of Urban Transportation Funds

As flexibility among federal programs increases and

federal funding becomes greater, the funds available to California - and thence the Bay Area - for urban transportation purposes on a year-by-year basis can be estimated. Proposed federal legislation recognizes this and UTAP provides for apportionment by state beginning in FY 1978. Some funds will probably remain unapportioned, to be used as special capital assistance on large transit projects. Apportionment to the state will allow the Bay Area and the remainder of California to better coordinate programming of federal funds and federally directed planning efforts. Funding needs at the state and substate levels may then be assessed and estimated earlier and appropriate revenue sources secured.

B. TRANSIT FINANCING TRENDS AT THE STATE AND SUBSTATE LEVELS

A wide variety of resources are available to states for funding transit. With the increasing frequency of financial crises in transit and their widespread occurrence in many urban areas, states have responded in a number of ways. Since most substate governmental units - including general purpose local governments and single purpose regional agencies - are created and empowered by the states, remedies for application at the local and regional level must be secured at the state level. Thus, state and substate financial legislation and trends are impossible to clearly separate and will be listed together.

1. Greater Participation and Intervention

A number of states are providing funding and are participating directly in transit operations and planning. For example, the State of Maryland now directly operates and funds urban transportation services in the Baltimore region. Massachusetts has recently taken over control of Boston area services in cooperation with the local governments involved. Financial participation in the Boston area includes underwriting approximately 50% of the net operating costs, in addition to various capital assistance programs. Financing of capital and operating expenses are being considered by California. Past experience has been to become involved in capital funding first, with assistance for operating costs coming later. California's Transit Development Act of 1971 marked the beginning of this state's involvement in transit operating cost support. The role of the state can be expected to increase, although the magnitude cannot be predicted.

2. More Sources to be Utilized

As the need for additional transit funding becomes more critical both in terms of time and amount, a variety of new sources can be expected to be utilized. Included in those sources presently employed elsewhere are the cigarette tax in Massachusetts and Indiana, the income tax in New Jersey, a wheelage tax in Minnesota, and toll bridge revenues in

the New York City and Philadelphia/Camden areas. Highway funds, general funds, municipal and state general and special sales taxes, and property taxes are also used. Other sources being considered include state lottery receipts, liquor and other excise taxes, parking charges, and various special fees. Considerations as to the type of sources used include equity, magnitude of funds, relatedness of source to transit service, local and state acceptance and legal limits.

3. Greater Local Autonomy in Funding

As programs at both the federal and state level become more flexible, a variety of choices concerning how available funds will be spent will be increasingly exercised at the local level. It is conceivable that a number of potential revenue sources will be made available to urban areas, including the Bay Area, which can then be assessed with respect to the area's unique circumstances and needs, thereby allowing the most appropriate sources to be utilized. For example, a single revenue source which would have to be utilized if it were the only source legally available might not be employed if an array of potential sources existed.

Programs and funds presently limited to only highway and transit purposes will most likely be broadened to include other modes. The ability to meet transportation needs

unique to each urban area will, as a result, be enhanced. The use of highway trust funds at both the federal and state levels for non-highway purposes is an example. Present proposals at the federal level include a merging of the the Urban Systems funds with UMTA funds to meet all urban transportation needs. Subventions to local governments will be used in innovative multimodal projects.

4. More Flexibility in Programs

The financial needs of transit are for both capital and operations. Increasing flexibility to meet local and regional needs for capital and operating expenses can be expected at the State and substate levels. This would match the intent of proposed federal legislation and complement multimodal funding. Proposals to relax the limitations on Transportation Development Act funds for operating expenses are being considered by the State Legislature.

5. More Local Efforts

There are numerous sources of revenue and in-kind services available at the local level which do not require enabling legislation at the federal or state level. Property taxes and certain special fees can be used to provide additional support for transit. Special assessment districts, such as the one utilized to underground BART in Berkeley, can also be implemented locally. The relaxa-

tion of certain local requirements can be offered as a tradeoff for direct or indirect support of transit. An example would be the provision of monthly transit passes to tenants as grounds for waiving off-street parking space requirements. The provision of transit amenities - shelters, information, tickets, etc. - can be used as a mitigating measure for the impact of large traffic generators. This provides transit some of the facilities and services that it is unable to offer due to existing legal and financial restrictions.

6. Miscellaneous Revenue Sources

Other revenue sources which have been suggested include taxes on fuel and vehicles, which can be adjusted according to horsepower, weight, engine displacement, value, type of fuel, use of vehicle, etc. Also, taxes are possible on the parking of vehicles both on the street and in public and private off-street facilities. Taxes on development activity might include those on new land subdivisions; residential, commercial, and industrial units; air rights development; and recorded deeds and property transfers. Possible taxation of economic activity include those on payrolls, luxuries, utilities, business licenses and franchises, and hotels. Revenue could also be derived from lotteries and the sale or leaseback of public lands benefiting directly from transportation improvements.

C. REVISED REVENUE MAGNITUDES ANTICIPATED

The unfunded portion of transit development costs vary from around 17% (Basic Plan) to around 25 % (Recommended Plan). As expected, the major unfunded item is transit operating cost. However, the figures developed for Chapter VI make the assumption that all capital projects will be funded by the Federal government at the current 80% ratio. Under present capital funding programs, the Bay Area competes for these capital funds with other regions of California, and California competes with other states. As a result, given current formulas we would need a quadrupling of transit capital grants (i.e. Congressional appropriations) by 1984 at the national level in order for the required amounts to filter into the Bay Area.

Still, 80% capital funding from existing legislation is the most optimistic money source for transit. Most other sources first require legislative action, usually involving a lengthy process. A sampling of potential new local revenue sources is described in Table VIII-1 with the amount of funds each could raise in a 5-year period under the conditions specified:

(see next page)

Table VIII-1

Potential Alternate Revenues*
 FY 1975-FY 1979
 (\$ million, $\pm$ 10-20 %)

a.	<u>Sales Tax**</u>	<u>3 Counties</u>	<u>5 Counties</u>	<u>9 Counties</u>
	1/2¢	\$228	\$371	\$430
	1¢	\$456	\$742	\$860
b.	Toll Bridge Surpluses***			\$ 88
c.	Gas Tax - 2¢ gallon (9 counties)			\$258
d.	In Lieu (Personal Property) Tax - \$20/vehicle (9 County)			\$216
e.	Property Tax-25¢/\$100 valuation (9 counties)			\$223

*Source: "Special Report on Transit Finance",
 by the Metropolitan Transportation Commission,
 April 10, 1974.

**These estimates should be reduced by \$113
 million since these funds are obligated for
 BART construction financing.

***No funds may be available in this period as
 Dumbarton Bridge financing, BART tube bonds
 and state highway debt obligations may elim-
 inate all surplus.

D. EVALUATION FACTORS FOR NEW REVENUE SOURCES

Decisions to advocate new taxes or other revenue sources to support public transit must be based on factors besides total fund-raising potential and ease of securing legislative passage. Possibly the most important factor is taxpayer equity, a concept which can be taken in various and often conflicting senses. One aspect of equity relates to the correspondence between the geographic origin and application of public funds. The inevitable question here is determining the service area for a particular transit facility. The BART system is financed by taxes in a three-county area, but

residents actually receive service in differing amounts. For example, many residents of Daly City, who pay no direct BART taxes, are far closer to BART service than residents of the Amador Valley. And on the national scale, some heavily urbanized states receive higher levels of federal capital assistance for transit proportionate to population or income than do rural states.

Another aspect of equity relates to the incidence of costs and benefits of public transit among various beneficiary groups of the population. Much earlier, the prime beneficiary group of public transit was viewed as the rider, a notion which led to the theory that public transit should be totally supported by fare revenues. An analogous situation pertained to highways, where gasoline taxes were reserved solely for road construction purposes.

Recently a broader concept regarding the beneficiary groups of public transit has developed. Public transit has begun to claim a role in reducing air pollution, in lessening social and environmental consequences of increasing mobility, in reducing highway congestion, and in preserving the neighborhood structure of various cities. All of these benefits are far more widespread among geographic areas and social groups than are the immediate travel benefits to the transit rider.

Finally, the social equity of any proposed taxation measure

must not be overlooked. Revenue-raising mechanisms can be characterized as being progressive, neutral, or regressive. A regressive tax is one which takes a higher percentage of the income of a poor person than it does of the income of a wealthy person. Arguments favoring progressive taxation are generally based on the notion that society benefits from the reduction of poverty and from the diminishing as a whole of extreme income-class differences. The property tax is an example of a tax which is generally regressive. The income tax is typically progressive, while the sales tax can range from regressive to neutral depending on the specific legislation. Public transit's role in promoting equal social and economic opportunity is evident in that it allows persons who have no access to a car because of financial, health, physical, and other reasons to have access to employment, recreation, shopping, health care, cultural activities, and social contacts.

Several other factors can be considered in evaluating new revenue sources for public transit. One is suitability for supporting bonded debt. Incurring bonded debt essentially makes a great deal of money available in the present at the expense of repaying a higher amount over the long run. In order to take advantage of this, a revenue source to support the bonds must be stable and continuous. Another factor is the ease of applying, collecting, and apportioning a tax revenue. A revenue source subject to widespread

evasion and dispute will not be practical. Finally, consideration must be given to the indirect effects of taxation proposals, as these effects could either support or detract from important social and political objectives. For example, the taxation of motor vehicles with high horsepower in comparison to weight could in addition to providing funds for transit discourage the ownership of a vehicle type which is characterized by extravagant fuel usage and high emission of air pollutants.

F. SUMMARY

Much legislative progress must be made to develop revenue sources capable of supporting the improved regional transit systems envisioned in this document. Numerous sources are potentially available but many, such as the property tax, are already stretched to their limit of public acceptance. Consequently, innovative legislative initiatives will have to be undertaken. This document is not intended to go further than pointing out some alternative new revenue sources for transit and their implications, since MTC has advocated flexible funding for all transport modes. Estimates of funding requirements are being made for other modes, after which detailed financing proposals will be presented in the revised Regional Transportation Plan, Section IV, to be adopted in June of 1974.

Chapter IX

APPLICATION OF NEW TRANSIT TECHNOLOGY

The Bay Area Rapid Transit (BART) District has been one of the foremost innovators in the application of new technology to public transit. Among the innovations incorporated in the BART system are the automatic stored-fare transit ticketing arrangement, the design of high-speed, light-weight and comfortable rolling stock, and the automatic train control system. The application of this technology has not been easy, however, as the train control system has yet to be perfected to allow full operation of the BART system, and operating costs are skyrocketing, as in less technically elegant transit operations. Still, there can be little doubt that the pioneering of new transit technology by the BART District is paying off with better service and a large potential gain in patronage.

Many other advances in transit technology have been made in other parts of the U.S. and the world which have potential application in the Bay Area. The Urban Mass Transportation Administration (UMTA) of the U.S. Department of Transportation sponsors experiments in new transit technology under its Research, Demonstration, and Development Program (RD&D). The results of these projects are made known to other areas

through UMTA publications. RD&D Projects are generally funded 100% by the Federal government and must represent unique technical approaches to transit problems.

Various projects demonstrating new transit technology have produced results which have been applied in the Bay Area. One of the best-known UMTA demonstration projects has been the test of a demand-actuated (or Dial-a-Bus) transit system in Haddonfield, New Jersey. At present, A-C transit is preparing to institute such a system in the City of Richmond in order to furnish local transit service and enhance feeder service to BART. Several other UMTA-funded transit planning technical studies have recommended demand-responsive systems, such as in Santa Rosa, Napa, and Central Contra Costa County. The major impediment to the implementation of these recommendations is, as usual, operating costs which are higher per vehicle mile than for conventional bus systems. As a result of this cost constraint, only A-C Transit's demand-responsive system in Richmond is close to implementation.

UMTA-sponsored research on Personal Rapid Transit (PRT) systems is also being closely studied by Bay Area transportation planners, particularly as it relates to Santa Clara County. Many feel that this kind of transit system is especially suited to Santa Clara's low-density development and dispersed travel characteristics and are anxious to

view the results of PRT testing being conducted in Morgantown, West Virginia and the new PRT test facility to be constructed at Broomfield, Colorado.

A new device with potential benefits to the San Francisco MUNI is the kinetic energy wheel, a flywheel mechanism which can store energy sufficient to propel a transit vehicle for some distance without the need for external connection to a third rail or overhead wires. Applied to MUNI's trolley bus operations, vehicles could bypass auto congestion or breakdowns on roadways, could be more easily maneuvered in storage yards, and routes could be extended without constructing more overhead wires. The device also saves on energy consumption as it can derive energy from the braking of the vehicle during stops.

Research and testing by UMTA and the U.S. Department of Health, Education, and Welfare have evaluated and improved EIP (Environmental Improvement) kits for diesel bus exhaust and noise control. Some of the testing was performed on General Motors coaches delivered to San Francisco's MUNI. Now these packages are standard installations on many vehicles of the MUNI, Golden Gate, and A-C Transit fleets.

MTC's Special Transit Needs Study is utilizing the results of UMTA's investigation of the travel needs of low-mobility groups such as the poor, elderly, handicapped, etc. The

implications of this work include determining each group's unique travel demands, as well as exploring means of applying technology to provide them better transit service.

Other federally-funded research programs which have provided valuable guidance to Bay Area transit planners have been:

- the Intermodal Integration Program developed by UMTA and Interplan, Inc.;
- UMTA-sponsored development of improved data processing procedures for modeling and analyzing transit networks;
- demonstrations of transit preferential street and highway modifications.

MTC anticipates and encourages the application of new technology to this region's transit problems, and accordingly maintains an extensive library facility open to use by the transit operators, other public officials, and the citizenry-at-large. Here can be found domestic and foreign reports describing recent progress and innovation in the field of public transit. While interest can almost always be stimulated in the use of new technology, as usual the barrier to implementation on a non-demonstration basis relates to the lack of funding.

Chapter X

UPDATING THE TRANSIT DEVELOPMENT PROGRAM

The annual updating of the MTC's Regional Transportation Plan takes place formally in June of each year, following technical analysis and public discussion of proposed revisions. The Transit Development Program, forming the transit programming basis for the Regional Transportation Plan will likewise be amended annually, although on a slightly advanced schedule. Because of the growing interrelatedness of highway and transit funding, the financial plans for the various modes must be increasingly integrated, causing the need for preparation of both the transit and highway plan elements earlier in the year than is now the case.

Revisions to the Transit Development Program will arise from several sources. First, the annual submission by the transit operators of claims for Transportation Development Act (SB 325) funds provides a fresh and detailed picture every spring of immediate capital and operating needs. Second, the transit planning technical studies funded by UMTA report to MTC on a quarterly basis. Together with the MTC staff liaison to the various planning projects, these reports allow the most recent findings of these projects to be evaluated in the regional planning context and ultimately to be appropriately incorporated into the Transit Development

Program. Finally, continual contact between MTC and the various agency staffs as well as the Transit Federation will be maintained to further develop working relationships and understanding of the problems, needs, plans and programs of transit in the Region. These will provide the basic inputs to and be part of the continuing evolutionary process of refining and updating the Transit Development Program.

This process of a coordinated review of the Transit Development Program and other transportation mode needs is consistent with MTC's statutory requirements and will maintain the Region's eligibility for Federal capital and technical assistance under existing grant programs.

Chapter XI

APPENDIX

PUBLIC TRANSIT SERVICES AND OPERATIONS

Sources:

- MTC Resource Management Division
- Transit Operator Claims for funds
under Transit Development
Act for FY 1974

Table 1

NINE COUNTY BAY AREA SUMMARY OF EQUIPMENT IN USE AND PROJECTED

MAJOR AND SMALL TRANSIT OPERATORS

Fiscal Year	<u>1973-74</u>	<u>1974-75</u>	<u>1975-76</u>	<u>1976-77</u>	<u>1977-78</u>
<u>MAJOR OPERATORS</u>					
Bus	1606	1710	1740	1735	1735
Electric Streetcars	105	115	-0-	-0-	-0-
Trolley Coaches	334	334	335	335	335
Cable Cars	39	39	39	42	42
Subway/Surface	-0-	-0-	80	80	80
BART-Cars	<u>250</u>	<u>350</u>	<u>450</u>	<u>450</u>	<u>450</u>
TOTAL	2360	2540	2636	2684	2684
<u>SMALL OPERATORS</u>					
Buses	38	65	66	67	68 ¹
<u>TOTAL COMBINED</u>					
Buses	1644	1775	1806	1802	1803
Electric Streetcars	105	115	-0-	-0-	-0- ²
Trolley-Coaches	334	334	335	335	335 ²
Cable Cars	39	39	39	42	42 ²
Subway/Surface	-0-	-0-	80	80	80
BART-Cars	<u>250</u>	<u>350</u>	<u>450</u>	<u>450</u>	<u>450</u> ³
TOTAL	2372	2613	2710	2709	2710

Notes:

Data above based on information from claimants prior to "energy crisis."

1. It is possible that there will be a proliferation of small systems in FY 1974-75 Applications for TDA Funds.
2. Equipment driven by Electric Power only - relatively low speed.
3. High Speed - Electric.

Table 2

ANALYSIS OF COUNTY POPULATION AND POPULATION

BEING SERVED* BY TRANSIT DISTRICTS

1973-74

	County Population	Percent	By BART & AC	By BART & MUNI	By G/G	By S. Clara
Alameda	1,120,800	64.29	720,516			
Contra Costa	549,800	17.82	105,990			
San Francisco	<u>715,679</u>	<u>100.00</u>	<u> </u>	<u>715,679</u>		
SUBTOTAL	2,431,279	63.0				
Marin	206,758	65.0			134,392	
Sonoma	225,400	15.0 35.0			33,810 ¹ 15,890 ²	
Santa Clara	<u>1,160,200</u>	<u>40.0</u>	<u> </u>	<u> </u>	<u> </u>	<u>464,080³</u>
TOTALS	4,023,637	54.0 55.0	826,506	715,679	168,192 213,282	464,080

1. Does not include Santa Rosa.

2. Includes Santa Rosa.

3. Does not meet minimum service levels.

* Qualified Statement of MTC Resource Management Division.

Population residing within 1/2 mile of transit route which operates on a minimum of 60 minute headway and includes time frame spanning morning to evening commute period.

TABLE 3

PASSENGERS CARRIED - FY 1974

(Public Transit Operators)

MAJOR TRANSIT OPERATORS

A/C TRANSIT	53,657,000
BART	14,827,000
MUNI (BUS)	122,621,000 (47,700,000)
G. GATE	8,290,000
SANTA CLARA	<u>2,100,000</u>
	<u>201,495,000</u>

SMALL OPERATORS

SAN MATEO	1,119,558
NAPA	50,400
SOLANO	437,338
SONOMA	<u>272,481</u>
Sub Total	1,879,777
TOTAL	<u>203,374,777</u>

Table 4

PUBLIC TRANSIT SERVICE BY MODE: FY 1974

	MUNI	AC	BART	GGBHTD	SCCTD	S.M.Co.*	N.BAY Cos.	SYSTEM TOTALS
BUS								
EQUIPMENT	550	753	-	188	60	20	18	1,589
PATRONAGE	47,700,000	53,657,000	-	7,290,000	2,100,000	1,120,000	760,000	112,627,000
VEH.MILES	13,900,000	27,219,000	-	7,242,000	4,862,000	1,150,000	570,000	54,943,000
ROUTES	51	75	-	29	19	16	16	206
TROLLEY/ STR. CAR/ CABLE CAR								
EQUIPMENT	490	-	-	-	-	-	-	490
PATRONAGE	74,921,000	-	-	-	-	-	-	74,921,000
VEH.MILES	11,325,000	-	-	-	-	-	-	11,325,000
ROUTES	21	-	-	-	-	-	-	21
RAPID RAIL								
EQUIPMENT	-	-	250	-	-	-	-	250
PATRONAGE	-	-	14,827,000	-	-	-	-	14,827,000
VEH.MILES	-	-	10,272,000	-	-	-	-	10,272,000
ROUTES	-	-	2	-	-	-	-	2
FERRY								
EQUIPMENT				1				1
PATRONAGE				1,000,000				1,000,000
VEH.MILES				N.A.				N.A.
ROUTES				1				1

* Interim estimates pending action by UMTA.

Table 5
COMPARISON OF FARE STRUCTURES
LARGE TRANSIT OPERATORS
(dollars)

	BARTD (RAIL) ¹	AC TRANSIT ³	MUNI* ²	GOLDEN GATE ⁴ TRANSIT	SCCTD ²
ADULT ONE ZONE	.30	.25	.25	.25	.25
CHILD ONE ZONE	.075	.15	.05	.15	.10
SENIOR CITIZEN ONE ZONE	.075	.10	.05	.15	.10
MAXIMUM ADULT LOCAL FARE	1.25	.60	.25	.75	.25
RANGE OF TRANS- BAY ADULT FARES	.55 - 1.25	.55 - .80	N.A.	.50 - 1.50	N.A.

AGE VARIANCE

Child = 12 to 16

Senior= 62 to 65

1. BARTD Zone - Mi. Fare - Per mile increments.
2. MUNI & Santa Clara - Single zone systems.
3. AC - Four zones.
4. GGT - Five zones.

Table 6

CURRENT AND PENDING TRANSFER ARRANGEMENTS
LARGE TRANSIT OPERATORS

FROM:	BART	AC TRANSIT	MUNI	GOLDEN GATE	SCCTD
TO:					
BART	free	full fare	12.5¢	no arrangement	no arrangement
AC	free	free	no arrangement	no arrangement	not applicable
MUNI	12.5¢	no arrangement	free	no arrangement	not applicable
GOLDEN GATE	no arrangement	no arrangement	no arrangement	free	not applicable
SCCTD	no arrangement	not applicable	not applicable	not applicable	free

Note: The Golden Gate Ferry is not involved in any transfer arrangements.

Table 7

COMPARISON OF BUS FARE STRUCTURES AND TRANSFERS - SMALL OPERATORS (dollars)

	NAPA CITY BUS SYSTEM	SANTA ROSA MUNICIPAL TRANSIT	VALLEJO TRANSIT LINES	BURLINGAME MINIBUS TRANSIT	FOSTER CITY BUS	MENLO PARK TRANSIT SYSTEM	PACIFICA C&C TRANSIT ¹	REDWOOD CITY MUNICIPAL TRANSIT	SAN CARLOS TRANSIT SYSTEM	SAN MATEO TRANSIT SYSTEM
ADULT	.25	.25	.25	.25	.25	.25	.35	.25	.25	.35
CHILD	.10	.15	.15	.10	.10	.15	.25	.15	.15	.35
SENIOR CITIZEN	.25	.25	.10*	.10	.10	.15	.25	.25	.15	.35
MAXIMUM ADULT FARE	.25	.50 ²	.25	.25	.25	.25	.35	.25	.25	.35

TRANSFERSTO ANOTHER
ROUTE, SAME
OPERATOR

-

.05

free

free

free

free

only one
route

free

free

free

TO ANOTHER
PUBLIC
OPERATOR

n.a.

no
arrange-
ment
w/GG

n.a.

n.a.

no
arrange-
ment w/
Menlo P.
City; no
arrange-
ment w/SCCTD.10
transfer
to Redwood
n.a..10
transfer
to Menlo
Park.10
transfer
from
Redwood C.
lines only

n.a.

1. Private operator until 7/1/74

2. Jitney route fare

* Proceed

n.a. = not applicable

Table 8

FY 1973-74 Financial Status of Transit Operators

(thousands of dollars)

	<u>SF MUNI</u>	<u>AC</u>	<u>BART</u>	<u>GGBHTD³</u>	<u>SCCTD</u>	<u>S.M. Co.</u>	<u>N.Bay Co's.</u>	<u>SYSTEM TOTALS</u>
Oper. Cost	59,020	29,073	38,197	10,073	5,745	691	420	143,219
Capital Imprv.	38,439	4,056	148,033	17,710	9,164	1,193	352	218,947
Debt Service	3,000	1,143	88,978 ⁷	-0-	-0-	-0-	-0-	93,121
 TOTAL	 100,459	 34,272	 275,208	 27,783	 14,909	 1,884	 772	 455,287
Oper. Rev.	26,017	16,325	23,782 ¹³	4,582	2,420	213	242	73,581
Prop/Gen Tax	36,133 ⁶	9,880	48,229 ⁸	420 ⁴	-	-	-	94,662
Sales Tax	-	-	33,909	-	-	-	-	33,909
Bond Proceeds	3,800 ¹	-	74,468 ⁹	-	-	-	-	78,268
TDA	4,214	4,430	5,603	1,840	5,639	891	331	22,948
Tolls	-	-	10,600 ¹⁰	9,374 ⁵	-	-	-	19,974
Reserves	-	976	9,928 ¹¹	-	-	-	-	10,904
Other	4,500 ²	-	-	-	3,265 ¹²	226 ¹²	36 ¹²	8,027
Federal Aid	25,795	2,661	68,689	11,567	3,585	554	163	113,014
 TOTAL	 100,459	 34,272	 275,208	 27,783	 14,909	 1,884	 772	 455,287

Notes: See next page.

Notes to Table 8

1. SFMRIC estimated contribution.
2. Hetch Hetchy estimated contribution.
3. Includes cost-revenue figures associated with Ferry operations and capital improvement in addition to bus data.
4. Marin County Transit District.
5. Contribution from bridge tolls in this amount is needed to meet anticipated expenses.
6. Contribution from city general tax funds in this amount is needed to meet anticipated expenses.
7. Includes service on tube bonds (\$10.6m), sales tax revenue bonds (\$33.909m), and general obligation bonds (\$44.469m).
8. Includes property taxes for bond service (44.469m) and for operations (\$3.760m).
9. Includes all funds other than Federal grants and TDA money being spent on capital improvements.
10. BTC contribution on tube bonds.
11. Estimate of operations fund reserves (\$7.0m) and interest income applied to operations.
12. Unspecified source, needed to meet anticipated expenses.
13. Includes an extraordinary contribution from capital reserves and self-insurance fund.

General Notes to Tables Following:

E + C System Financing

FY '75 - '84

The following 10-year projections are based on transit operator data as submitted to MTC's Resource Management Division in conjunction with FY 1974 claims for Transit Development Act funds (SB 325).

The 5-year data presented therein by each existing operator is presumed to include operation of not only the June 30, 1973 system, but that of an expanded system as reflected in 5-year capital improvement proposals. Where federal grants are pending, these amounts are shown. Operating deficits have been forecast by MTC staff from FY '78 through FY '84 based on clearly outlined assumptions.

This package therefore represents the financing implications of what is termed:

"the existing + committed system."

Table 9

OPERATING DEFICITS FOR PUBLIC TRANSPORTATION
without TDA Funds (\$ millions)

	FISCAL YEAR	S.F. MUNI ^A	AC ^B	BART ^C	GGBHTD ^D	SCCTD	SM Co.	Napa Co.	Solano Co.	Sonoma Co.	Annual TOTALS
OPERATOR DATA	1974	33.00	2.87	10.65	5.07	3.33	.48	.02	.13	.03	55.58
	75	32.84	5.87	6.52	7.37	4.16	.83	.03	.18	.02	57.82
	76	36.13	7.75	21.27	8.19	5.15	.90	.03	.18	.03	79.63
	77	39.45	9.63	24.04	7.88	6.10	.94	.04	.19	.03	88.30
	78	42.96	10.59	27.49	8.77	6.11	.99	.04	.19	.03	97.17
MTC PRO- JECTION ^E	79	46.83	12.39	30.24	9.47	6.72	1.09	.04	.21	.03	107.02
	80	51.04	14.50	33.26	10.23	7.39	1.20	.05	.23	.04	117.94
	81	55.63	16.96	36.59	11.05	8.13	1.32	.05	.25	.04	130.02
	82	60.64	19.84	40.25	11.93	8.94	1.45	.06	.28	.04	143.43
	83	66.10	23.22	44.28	12.89	9.83	1.60	.06	.30	.05	158.33
	84	72.05	27.17	48.71	13.92	10.81	1.76	.07	.33	.06	174.88
10-YEAR TOTAL		503.67	147.92	312.65	101.70	73.34	12.08	.47	2.34	.37	1,154.54

Footnotes: See next page.

Notes to Table 9

Note A

SF MUNI's operating deficit has been successfully financed through FY 1974 from a combination of general property taxes, federal revenue sharing funds and SB 325 transit aid. Thus, extending this existing level of tax assistance would significantly lower the indicated operating deficit over ten years, which reflects the application of fare revenues only.

Note B

AC Transit's operating deficit is shown net of contributions from both fare revenues and the 31.1¢ district property tax.

Note C

A series of internal refinancing measures involving self-insurance funds and some capital reserves have fully satisfied the FY 1974 deficit from BART operations as projected. However, for the FY 1975, even with \$10.84m to be transferred from capital to operating funds, an unfunded operations requirement is anticipated. The full amount of anticipated operating deficits are shown for the remaining nine years, net of fare revenues and 5¢ district property tax contributions.

Note D

GGBHTD's operating deficit is shown net of contributions from both fare revenues and the 5¢ MCTD property tax.

Note E

Trends in operating deficits (and in per-mile operating costs) are derived from recent records of the various transit operators. For projection purposes these rates of change have been adjusted according to operator estimates and judgment of MTC staff. The fare revenue component supporting operating costs was estimated assuming retention of existing fare structures and patronage as forecast by the operators.

Deficit projections for SCCTD and the various municipal operators in San Mateo, Napa, Solano and Sonoma Counties are net of fare revenues only.

Table 10

OPERATOR-PROPOSED CAPITAL IMPROVEMENTS FOR PUBLIC TRANSPORTATION
(thousands of dollars)

F.Y.	SF MUNI	AC	BART	GGBHTD	SCCTD	S.M.Co.	NapaCo.	SolanoCo.	SonomaCo.	ANNUAL TOTALS
1974										
Total Capital	38,439	4,056	148,033	17,710	9,164	1,134	50	19	245	218,850
Federal Grant	25,795	2,661	68,689	11,567	3,585	-0-	-0-	-0-	163	112,460
Bond Service	3,000	1,143	78,378	-0-	-0-	-0-	-0-	-0-	-0-	82,521
1975										
Total Capital	44,297	2,210	93,328	2,748	5,602	83	33	20	71	148,392
Federal Grant	29,543	1,473	60,453	1,650	1,607	-0-	20	-0-	47	94,817
Bond Service	3,000	1,162	81,494	-0-	-0-	-0-	-0-	-0-	-0-	85,656
1976										
Total Capital	40,019	4,246	27,838	2,202	5,868	104	44	-0-	11	80,332
Federal Grant	24,951	2,831	23,900	1,468	2,207	-0-	-0-	-0-	7	55,409
Bond Service	1,500	1,160	72,109	-0-	-0-	-0-	-0-	-0-	-0-	74,769
1977										
Total Capital	12,817	5,117	4,438	200	31,528	60	44	-0-	11	54,215
Federal Grant	8,233	4,094	1,641	-0-	30,128	-0-	-0-	-0-	7	44,129
Bond Service	2,900	1,174	47,455	-0-	-0-	-0-	-0-	-0-	-0-	51,529
1978										
Total Capital	6,358	5,628	639	200	13,330	198	68	-0-	11	26,432
Federal Grant	6,367	4,502	-0-	-0-	11,179	-0-	23	-0-	7	22,165
Bond Service	3,700	1,291	48,403	-0-	-0-	-0-	-0-	-0-	-0-	53,394
1979 → 84										
Total Capital	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Federal Grant	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Bond Service	24,000	4,560	357,849	-0-	-0-	-0-	-0-	-0-	-0-	386,409
TEN-YEAR TOTAL (FY75-84)										
Total Capital	103,491	17,201	126,243	5,350	56,328	445	189	20	104	309,371
Federal Grant	69,094	12,900	85,994	3,118	45,120	-0-	43	-0-	68	216,337
Bond Service	35,100	9,347	607,310	-0-	-0-	-0-	-0-	-0-	-0-	651,757

Table 11
A/C TRANSIT OPERATING LOSSES
(IN THOUSAND DOLLARS)

	<u>73/74</u>	<u>74/75</u>	<u>75/76</u>	<u>76/77</u>	<u>77/78</u>
TOTAL OPERATING COST	29,073	30,353	32,624	34,939	38,432
REVENUES	16,325	14,008	13,878	13,762	15,138
TAXES	9,880	10,473	10,996	11,545	12,700
TDA	<u>2,100</u>	<u>3,394</u>	<u>3,027</u>	<u>-0-</u>	<u>-0-</u>
Subtotal	28,305	27,875	27,901	25,307	27,838
TOTAL OPERATING DEFICIT	768	2,478	4,723	9,632	10,594

Table 12

A/C TRANSIT CAPITAL IMPROVEMENTS

	<u>73/74</u>	<u>74/75</u>	<u>75/76</u>	<u>76/77</u>	<u>77/78</u>
Capital Improvements	4,056	2,210	4,246	5,117	5,628
Bond Cost	<u>1,143</u>	<u>1,162</u>	<u>1,160</u>	<u>1,174</u>	<u>1,291</u>
Subtotal	5,199	3,372	5,406	6,291	6,919
Less: Federal Grants	2,661	1,473	2,831	-0- ⁽¹⁾	-0- ⁽¹⁾
TDA	<u>2,330</u>	<u>1,699</u>	<u>2,575</u>	<u>6,163</u>	<u>6,800</u>
Subtotal	4,991	3,172	5,406	6,163	6,800
 TOTAL CAPITAL DEFICIT	 208	 200	 -0-	 128	 119
 <u>TOTAL Tables 11 and 12</u>					
Grand Total Deficit	976	2,678	4,723	9,760	10,713
Passenger Vehicles	753	753	753	753	753
Acquisitions	90	42	78	90	80

(1) Projections have not been made.

Table 13

BART OPERATING LOSSES

(IN THOUSANDS OF DOLLARS)

	<u>73/74</u>	<u>74/75</u>	<u>75/76</u>	<u>76/77</u>	<u>77/78</u>
Total Operating Costs	38,197	52,914	59,380	63,192	68,445
Revenues					
Operating	23,782	31,704	34,160	35,103	36,803
Transfer from Cap. Reser.		10,841			
05¢ Tax	3,760	3,854	3,950	4,049	4,150
TDA	<u>727</u>	<u>800</u>	<u>880</u>	<u>968</u>	<u>1,064</u>
Subtotal	28,269	47,199	38,990	40,120	42,017
Total Operating Deficit	9,928	5,715	20,390	23,072	26,428

Table 14

BART CAPITAL IMPROVEMENTS

(IN THOUSAND DOLLARS)

	<u>73/74</u>	<u>74/75</u>	<u>75/76</u>	<u>76/77</u>	<u>77/78</u>
Capital Improvements	148,033	93,328	27,838	4,438	639
Less: Federal Grants	68,689	60,453	23,900	1,641	-0-
Other	74,468	28,178	3,583	189	639
TDA	<u>4,876</u>	<u>4,697</u>	<u>4,697</u>	<u>4,697</u>	<u>-0-</u>
Total Capital Deficit	-0-	-0-	(4,342)	(2,089)	-0-
<u>TOTAL Tables 13 and 14</u>					
Grand Total Deficit	10,228	5,715	16,048	20,983	26,428
Passenger Vehicle					
Total in System	250	350	450	450	450
Acquisitions	36	100	100		
Buses		32			

Table 15

MUNI OPERATING LOSSES

(IN THOUSAND DOLLARS)

	<u>73/74</u>	<u>74/75</u>	<u>75/76</u>	<u>76/77</u>	<u>77/78</u>
Total Operating Costs	59,020	58,552	61,697	65,014	68,526
Revenues:					
Operating Revenues	26,017	25,717	25,567	25,567	25,567
TDA	<u>1,461</u>	<u>1,607</u>	<u>1,768</u>	<u>1,944</u>	<u>2,140</u>
Subtotal	27,478	27,324	27,335	27,511	27,707
TOTAL OPERATING DEFICIT	31,542	31,228	34,362	37,503	40,819

Table 16

MUNI CAPITAL IMPROVEMENTS

	<u>73/74</u>	<u>74/75</u>	<u>75/76</u>	<u>76/77</u>	<u>77/78</u>
Capital Improvements	38,439	44,297	40,019	12,817	6,358
Bond Cost	<u>3,000</u>	<u>3,000</u>	<u>1,500</u>	<u>2,900</u>	<u>3,700</u>
Subtotal	41,439	47,297	41,519	15,717	10,058
Less: Federal Grants	25,795	29,543	24,951	8,233	6,367
City Grants	5,692	6,027	3,192	4,696	5,799
TDA	<u>2,752</u>	<u>3,027</u>	<u>3,329</u>	<u>3,662</u>	<u>4,030</u>
Subtotal	34,239	38,597	31,472	16,591	16,196
Total Capital Deficit	7,200	8,700	10,047	(874)	(6,138)

Total Tables 15 and 16

Grand Total Deficit	38,742	39,928	44,409	36,629	34,681
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Passenger Vehicles

Buses (diesel)	550	550	550	500	500
Electric Street Cars	105	105	-0-	-0-	-0-
Trolly Coaches-Electric	334	334	335	335	335
Cable Cars	39	39	39	42	42
Subway/Surface	-0-	-0-	80	80	80
Mini-Bus	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>50</u>	<u>50</u>
	1,028	1,028	1,004	1,004	1,007

Table 17

GOLDEN GATE TRANSIT DISTRICT

OPERATING LOSSES

(IN THOUSAND DOLLARS)

	<u>73/74</u>	<u>74/75</u>	<u>75/76</u>	<u>76/77</u>	<u>77/78</u>
Total Operations Costs	9,003	9,962	11,204	12,369	13,200
Revenues	3,882	3,555	4,275	5,808	5,793
TDA	460	1,500	800	2,000	2,500
MCTD Taxes	<u>420</u>	<u>450</u>	<u>481</u>	<u>500</u>	<u>550</u>
Subtotal	4,762	5,505	5,556	8,308	8,843
Total Operating Deficit	4,241	4,457	5,648	4,061	4,357

Table 18

GOLDEN GATE TRANSIT DISTRICT

CAPITAL IMPROVEMENTS

	<u>73/74</u>	<u>74/75</u>	<u>75/76</u>	<u>76/77</u>	<u>77/78</u>
Capital Improvements	3,331	272	1,760	100	100
Less: Federal Grants, local funds	1,991	272	586	100	100
TDA	<u>1,380</u>	<u>-0-</u>	<u>1,174</u>	<u>-0-</u>	<u>-0-</u>
Subtotal	3,371	272	1,760	100	100
Total Capital Deficit	(40)	-0-	-0-	-0-	-0-
<u>Total Tables 17 and 18</u>					
Grand Total Deficit	4,201	4,457	5,648	4,061	4,357
Buses	188	220	220	250	250

Note: Above is bus data only - ferry data and bridge are not included. The net deficit is revised after giving effect to TDA funds in both Operations and Capital.

Table 19

SANTA CLARA OPERATING LOSSES

(IN THOUSAND DOLLARS)

	<u>73/74</u>	<u>74/75</u>	<u>75/76</u>	<u>76/77</u>	<u>77/78</u>
Operating Expenses	5,745	7,420	9,055	10,395	10,835
Revenue	2,420	3,260	3,910	4,290	4,730
TDA	<u>3,325</u>	<u>4,160</u>	<u>5,145</u>	<u>6,105</u>	<u>6,105</u>
Subtotal	5,745	7,420	9,055	10,395	10,835
Total Operating Deficit	-0-	-0-	-0-	-0-	-0-

Table 20

SANTA CLARA
CAPITAL IMPROVEMENTS

	<u>73/74</u>	<u>74/75</u>	<u>75/76</u>	<u>76/77</u>	<u>77/78</u>
Capital Improvements	9,164	5,602	5,868	31,528	13,330
Less: Federal Grants	3,585	1,607	2,207	30,128	11,179
TDA	<u>2,314</u>	<u>2,043</u>	<u>1,678</u>	<u>1,400</u>	<u>2,151</u>
Subtotal	5,899	3,650	3,885	31,528	13,330
Total Capital Deficit	3,265	1,952	1,983	-0-	-0-
<u>Total Tables 19 and 20</u>					
Deficit	3,265	1,952	1,983	-0-	-0-
Buses	115	155	185	200	200

Table 21

City of Burlingame
San Mateo County

OPERATING COSTS PLUS CAPITAL IMPROVEMENTS

FIVE YEAR PROJECTION

	1973-74	1974-75	1975-76	1976-77	1977-78
<u>Operating Costs</u>	\$ 87,350	\$110,840	\$115,610	\$122,450	\$125,460
Revenues	17,800	35,600	38,300	41,000	43,500
TDA	<u>57,000</u>	<u>75,240</u>	<u>77,310</u>	<u>81,450</u>	<u>81,960</u>
Sub-Total	74,800	110,840	115,610	122,450	125,460
Deficit	12,550	-0-	-0-	-0-	-0-
 <u>Capital Costs</u>	 106,000	 52,100	 47,900	 27,900	 89,400
Depreciation	<u>-0-</u>	<u>13,900</u>	<u>14,500</u>	<u>15,000</u>	<u>18,000</u>
Sub-Total	106,000	66,000	62,400	42,900	107,400
TDA	<u>106,000</u>	<u>66,000</u>	<u>62,400</u>	<u>42,900</u>	<u>81,040</u>
Deficit	-0-	-0-	-0-	-0-	26,360
 Combined Deficit	 12,550	 -0-	 -0-	 -0-	 26,360
 Buses	 3	 4	 4	 4	 4
Acquisitions	3	1	--	--	--

Table 22

City of Foster City
San Mateo County

OPERATING COSTS PLUS CAPITAL IMPROVEMENTS

FIVE YEAR PROJECTION

	1973-74	1974-75	1975-76	1976-77	1977-78
<u>Operating Costs</u>	\$ 80,250	\$110,950	\$133,620	\$138,600	\$145,780
Revenue	20,200	33,700	37,200	40,800	44,500
TDA	<u>46,933</u>	<u>77,250</u>	<u>87,000</u>	<u>87,000</u>	<u>87,000</u>
Sub Total	67,133	110,950	124,200	127,800	131,500
Deficit Total	13,117	-0-	9,420	10,800	14,280
<u>Capital Costs</u>	120,200	500	24,885	500	76,250
Depreciation	<u> </u>	<u>13,020</u>	<u>13,020</u>	<u>17,710</u>	<u>17,710</u>
Sub Total	120,200	13,520	37,905	18,210	93,960
Les Federal Grants*	80,133	-0-	-0-	-0-	-0-
TDA	<u>40,067</u>	<u>9,750</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
	120,200	9,750	-0-	-0-	-0-
Deficit Total	-0-	3,770	37,905	18,210	93,960
Combined Deficit	13,117	3,770	47,325	29,010	108,240
Buses	3	3	3	3	3
Acquisitions	3	--	--	--	--

* Federal funding has been suspended pending the outcome of the transit district referendum.

Table 23

City of Menlo Park
San Mateo County

OPERATING COSTS PLUS CAPITAL IMPROVEMENTS

FIVE YEAR PROJECTION

	1973-74	1974-75	1975-76	1976-77	1977-78
<u>Operating Costs</u>	\$ 82,370	\$168,409	\$180,309	\$190,082	\$206,798
Revenues	17,000	37,400	41,140	45,254	49,779
TDA	<u>20,050</u>	<u>131,169</u>	<u>139,169</u>	<u>144,828</u>	<u>152,000</u>
Sub Total	37,050	168,409	180,310	190,082	201,779
Deficit	45,320	-0-	-0-	-0-	5,019
Capital Costs	101,950	-0-	-0-	-0-	-0-
Depreciation	<u>30,000</u>	<u>41,400</u>	<u>27,600</u>	<u>13,800</u>	<u>19,150</u>
Sub Total	131,950	41,400	27,600	13,800	19,150
TDA	131,950	20,991	12,831	7,172	-0-
Deficit	-0-	20,409	14,769	6,628	19,150
Combined Deficit	45,320	20,409	14,769	6,628	24,169
Buses	6	6	6	6	6
Acquisitions	6	--	--	--	--

Table 24

City of Pacifica
San Mateo County

OPERATING COSTS PLUS CAPITAL IMPROVEMENTS

FIVE YEAR PROJECTION

	1973-74	1974-75	1975-76	1976-77	1977-78
Operating Costs	\$ 92,200	\$240,050	\$254,523	\$269,990	\$286,529
Revenues	23,000	53,500	54,000	55,005	56,015
TDA	<u>-</u>	<u>164,000</u>	<u>164,000</u>	<u>164,000</u>	<u>164,000</u>
Sub Total	23,000	217,500	218,000	219,005	220,015
Deficit	69,200	22,550	36,523	50,985	66,514
Capitla Costs	711,000	-	-	-	-
Depreciation	<u> </u>	<u>53,000</u>	<u>53,000</u>	<u>53,000</u>	<u>53,000</u>
Sub Total	711,000	53,000	53,000	53,000	53,000
Less: Federal Grants*	474,000				
Other	20,000				
TDA	<u>217,000</u>	<u>53,000</u>	<u>53,000</u>	<u>53,000</u>	<u>53,000</u>
	711,000	53,000	53,000	53,000	53,000
Deficit	-	-	-	-	-
Combined Deficit	69,200	22,550	36,523	50,985	66,514
Buses	13	13	13	13	13
Acquisitions	13	--	--	--	--

* Federal funding has been suspended pending the outcome of the transit district referendum.

Table 25

City of Redwood City
San Mateo County

OPERATING COSTS PLUS CAPITAL IMPROVEMENTS

FIVE YEAR PROJECTION

	1973-74	1974-75	1975-76	1976-77	1977-78
<u>Operating Costs</u>	\$196,744	\$212,549	\$223,040	\$233,871	\$233,871
Revenues	80,019	80,835	81,660	82,485	82,485
TDA	<u>89,748</u>	<u>89,748</u>	<u>89,748</u>	<u>89,748</u>	<u>89,748</u>
Sub Total	169,767	170,583	171,408	172,233	172,233
Deficit	26,977	41,966	51,632	61,638	61,638
 <u>Capital Costs</u>	 -0-	 -0-	 -0-	 -0-	 -0-
Depreciation	23,252	23,252	23,252	23,252	23,252
TDA	<u>23,252</u>	<u>23,252</u>	<u>23,252</u>	<u>23,252</u>	<u>23,252</u>
Deficit	-0-	-0-	-0-	-0-	-0-
 Combined Deficit	 26,977	 41,966	 51,632	 61,638	 61,638
 Buses	 7	 7	 7	 7	 7
Acquisitions	--	--	--	--	--

Table 26

City of San Carlos
San Mateo County

OPERATING COSTS PLUS CAPITAL IMPROVEMENTS

FIVE YEAR PROJECTION

	1973-74	1974-75	1975-76	1976-77	1977-78
<u>Operating Costs</u>	\$ 86,000	\$122,900	\$130,900	\$139,700	\$150,100
Revenues	26,000	26,000	26,500	27,000	27,500
TDA	<u>56,000</u>	<u>96,900</u>	<u>104,400</u>	<u>112,700</u>	<u>122,600</u>
Sub Total	82,000	122,900	130,900	139,700	150,100
Deficit	4,000	-0-	-0-	-0-	-0-
 <u>Capital Costs</u>	 95,000	 -0-	 -0-	 -0-	 -0-
Depreciation	<u>-0-</u>	14,400	14,400	14,400	14,400
Sub Total	95,000				
TDA	<u>95,000</u>	<u>14,400</u>	<u>14,400</u>	<u>14,400</u>	<u>14,400</u>
Deficit	-0-	-0-	-0-	-0-	-0-
 Combined Deficit	 4,000	 -0-	 -0-	 -0-	 -0-
 Buses	 4	 4	 4	 4	 4
Acquisitions	4	--	--	--	--

Table 27

City of San Mateo
San Mateo County

OPERATING COSTS PLUS CAPITAL IMPROVEMENTS

FIVE YEAR PROJECTION

	1973-74	1974-75	1975-76	1976-77	1977-78
<u>Operating Costs</u>	\$ 65,900	\$246,000	\$254,500	\$263,200	\$272,300
Revenues	29,000	119,000	119,000	122,600	126,300
TDA	<u>1,933</u>	<u>15,533</u>	<u>15,867</u>	<u>16,167</u>	<u>16,333</u>
Sub Total	30,933	134,533	134,867	138,767	129,667
Deficit	34,967	111,467	119,633	124,433	129,667
<u>Capital Costs</u>	-0-	30,100	31,100	32,000	32,500
Depreciation	<u>5,800</u>	<u>16,500</u>	<u>16,500</u>	<u>16,500</u>	<u>16,500</u>
Sub Total	5,800	46,600	47,600	48,500	49,000
TDA	<u>5,800</u>	<u>46,600</u>	<u>47,600</u>	<u>48,500</u>	<u>49,000</u>
Deficit	-0-	-0-	-0-	-0-	-0-
Combined Deficit	34,967	111,467	119,633	124,433	129,667
Buses	9	9	9	9	9
Acquisitions	9	--	--	--	--

Table 28

City of Napa
County of Napa

OPERATING COSTS PLUS CAPITAL IMPROVEMENTS

FIVE YEAR PROJECTION

	1973-74	1974-75	1975-76	1976-77	1977-78
<u>Operating Costs</u>	\$ 41,200	\$ 55,000	\$ 70,000	\$ 75,000	\$ 85,000
Revenue	19,740	24,940	35,040	38,140	45,040
Other	760	760	760	760	760
TDA	<u>20,700</u>	<u>57,700</u>	<u>34,200</u>	<u>36,100</u>	<u>39,200</u>
Subtotal	41,200	83,400	70,000	75,000	85,000
Deficit	-0-	28,400	-0-	-0-	-0-
 <u>Capital Costs</u>	 50,000	 33,000	 44,000	 44,000	 68,000
Federal Funds	-	20,000	-	-	22,500
TDA	<u>50,000</u>	<u>13,000</u>	<u>44,000</u>	<u>44,000</u>	<u>45,500</u>
Sub Total	50,000	33,000	44,000	44,000	68,000
Deficit	-0-	-0-	-0-	-0-	-0-
 Combined Deficit	 -0-	 28,400	 -0-	 -0-	 -0-
 <u>Buses</u>	 2	 3	 4	 5	 6
Large Bus	-	1	-	-	1
Mini-Bus	-	-	1	1	-

Table 29

City of Vallejo
Solano County

OPERATING COSTS PLUS CAPITAL IMPROVEMENTS

Five Year Projection

	1973-74	1974-75	1975-76	1976-77	1977-78
<u>Operating Costs</u>	\$270,000	\$380,000	\$390,000	\$400,000	\$400,000
Revenue	141,225	200,000	206,000	212,000	212,000
TDA	<u>128,775</u>	<u>180,000</u>	<u>184,000</u>	<u>188,000</u>	<u>188,000</u>
Sub Total	270,000	380,000	390,000	400,000	400,000
Deficit	-0-	-0-	-0-	-0-	-0-
 <u>Capital Costs</u>	 19,225	 20,000	 -0-	 -0-	 -0-
TDA	<u>19,225</u>	<u>20,000</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
Sub Total	19,225	20,000	-0-	-0-	-0-
Deficit	-0-	-0-	-0-	-0-	-0-
 Combined Deficit	 -0-	 -0-	 -0-	 -0-	 -0-
 Buses	 10	 10	 10	 10	 10

Table 30

City of Santa Rosa
Sonoma County

OPERATING COSTS PLUS CAPITAL IMPROVEMENTS

FIVE YEAR PROJECTION

	1973-74	1974-75	1975-76	1976-77	1977-78
<u>Operating Costs</u>	\$108,469	\$108,223	\$111,574	\$115,027	\$118,583
Revenue	60,000	63,000	65,000	67,000	69,000
Other	20,324	20,324	20,324	20,324	20,324
TDA	<u>25,590</u>	<u>24,899</u>	<u>26,250</u>	<u>27,703</u>	<u>29,259</u>
Sub-Total	105,914	108,223	111,574	115,027	118,583
Deficit	2,555	-0-	-0-	-0-	-0-
 <u>Capital Costs</u>	 245,200	 71,000	 11,000	 11,000	 11,000
Other (not included in summary charts)	22,000	22,000	12,000	12,000	12,000
Depreciation	<u>15,517</u>	<u>30,117</u>	<u>36,117</u>	<u>36,117</u>	<u>36,117</u>
Sub Total	282,717	123,117	59,117	59,117	59,117
Federal Grant	163,456	47,333	7,333	7,333	7,333
TDA	<u>86,770</u>	<u>75,784</u>	<u>51,784</u>	<u>51,784</u>	<u>51,784</u>
Sub Total	250,237	123,117	59,117	59,117	59,117
Deficit	32,480	-0-	-0-	-0-	-0-
 Combined Deficit	 35,035	 -0-	 -0-	 -0-	 -0-
 Buses	 6	 6	 6	 6	 6

Chapter XII

GLOSSARY

A. ACRONYMS OF PUBLIC AGENCIES

A-C Transit: Alameda-Contra Costa Transit District

ABAG: Association of Bay Area Governments

AMTRAK: Federally-administered national rail passenger service.

BART: Bay Area Rapid Transit District

BAAPCD: Bay Area Air Pollution Control District

BATSC: Bay Area Transportation Study Commission

BCDC: Bay Conservation and Development Commission

CALTRANS: California Department of Transportation

EPA: U.S. Environmental Protection Administration

FHWA: Federal Highway Administration

GGBHTD: Golden Gate Bridge, Highway, and Transportation District

GGNRA: Golden Gate National Recreation Area

MTC: Metropolitan Transportation Commission

MCTD: Marin County Transit District

MUNI: San Francisco Municipal Railway

PUC: Public Utilities Commission

RASSC: Regional Airport Systems Study Committee

RTPC: Regional Transportation Planning Committee

SCCTD: Santa Clara County Transit District

SFMRIC: San Francisco Municipal Railway Improvement Corporation

SP: Southern Pacific Transportation Company

TF: Transit Federation of MTC

TCC: Traffic Coordinating Council of MTC

UMTA: Urban Mass Transportation Administration of U.S.D.O.T.

USDOT: U.S. Department of Transportation

B. DEFINITION OF TERMS

Ad Valorem:

Refers to property taxation, generally by municipalities or special districts, based upon the assessed value of real property.

Capacity:

The number of passengers which can be accommodated on a transit line during a particular time period. Capacity is a function of headway, vehicle size and speed.

Capital Cost:

Expenses for equipment and facilities including transit vehicles, maintenance machinery, buildings, land, parking lots, fare collection equipment, etc.

Corridor:

General linear path traversed by high-capacity transportation (roadway and transit) facilities.

Debt Service:

An amount of money which must be reserved annually to retire the principal and interest outstanding on bonded debt.

Deficit:

The shortfall of transit system revenues below costs, which is generally made up by a subsidy derived from public tax funds. Often the term deficit refers specifically to operating deficit, the shortfall of transit fare revenues

below operating costs. All of these terms are borrowed from the accounting lexicon of private business, where a deficit is tantamount to failure. Inasmuch as no major public transit system in the U.S. makes money, alternative terminology would be appropriate for transit finance.

Exclusive Right-of-Way:

A right-of-way designed only to be used by transit vehicles rather than subject to mixed auto/transit traffic. It may be grade-separated or not, when it is physically adjacent to another right-of-way such as a freeway.

Express Service:

Transit service which bypasses most stops made by local vehicles of the same transit system type along a transit corridor or line.

Feeder Transit:

A transit route generally consisting of buses on surface streets which delivers passengers to and from a trunk transit line.

Fiscal Year (FY):

A twelve-month year beginning on July 1 used for public financial accounting purposes. Most Federal, State, and Local budgets are made on this basis. The Fiscal Year 1975 spans July 1, 1974 to June 30, 1975.

Fixed Guideway:

A physical structure which determines and restricts the route which may be taken by a transit vehicle, eliminating the necessity for steering. Examples of fixed guideway transit systems, which are heavily capital-intensive, are BART, San Francisco streetcars and cable cars, Monorail systems, and Personal Rapid Transit (PRT) systems.

Grade-Separated:

A right-of-way physically separated in elevation from another transportation function occupying the same horizontal space. For example, this could signify a subway or an aerial structure for transit in the same alignment as a surface roadway.

Headway:

The length of time between arrivals of a transit vehicle on a particular line.

Local Transit:

A transit route which generally serves short-distance trips and characterized by operation of surface streets with frequent stops.

Mode:

Type of transportation system. On the most general level, refers to several large system categories such as transit, auto, walking, bicycling, etc. In addition, these modes are often classified more finely into sub-modes, as under transit: surface bus, light-rail, rapid transit, ferry, etc.

Non-Capital Intensive:

May refer either to an inexpensive capital project as an alternative to one involving a large capital cost, or to a project emphasizing operational improvements as opposed to construction of facilities or acquisition of equipment.

Operating Cost:

The non-capital cost of running a transit system, including labor, fuel, electricity, rent, and other such costs.

Patronage:

The number of passengers carried on a transit system or line for a specified time period.

Public Transportation:

In this report, it has signified transit systems owned or controlled by public entities such as municipalities or transit districts. However, often refers to transit systems open to use by the general public, thereby including privately-owned operations.

Rapid Transit:

Refers to a high-capacity transit system operating on a fixed or exclusive guideway.

R,D,&D:

Research, Development, and Demonstration; a grant program of the Urban Mass Transportation Administration, paying up to 100% of an experimental transit system with wide potential applicability.

Revenues:

Includes all sources of funding available to a public transit operator (fare revenues represent only that amount taken in from passengers). Fares and other related income may also be referred to as operating revenue.

R.T.P.:

The Regional Transportation Plan adopted by MTC in June of 1973 in accordance with the Commission's enabling legislation. Intended to guide long-range transportation development in the region, the RTP will be revised annually.

T.D.A.:

The Transit Development Act of 1971, also known as Senate Bill (SB 325) or the Mills-Alquist-Deddeh Act. This Act extended the general sales tax to gasoline, simultaneously making 1/4% of all sales tax proceeds available for public transportation improvements. Allocation of these funds is administered by MTC for the nine-county Bay Area. The funds are available for transit capital and operating expenses, bicycle and pedestrian ways and for highway improvements given no prior transit need.

Trunk Transit:

A high-capacity or high-speed or long distance transit line generally operating between cities, often on an exclusive right-of-way or partially on freeways, with limited boarding stops.

Vehicle Occupancy:

The average number of persons occupying an auto or transit vehicle, usually specified for a time period and geographic portion of a transport facility.

MTC staff who prepared this report were Dallas John, Lee Knight and Walter Stoll. Graphic work was prepared by Terry York and the cover was designed by Dallas John. The manuscript was typed by Phyllis Clay and Jean Molyneaux.

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